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VETERINARY MEDICINE

MONADNOCK BLOCK
Chicago

Rinderpest, Politics and Superstitions
By G. B. BOWERS

Luxated Vertebra in Dog Successfully Reduced
By E. B. BREITINGER

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Veterinary Medicine

Vol. XVI. APRIL, 1921 Number 4

Editorial Comment

No Lesion Tuberculin Reactors?

This class of cases are the cause of much doubt, much argument, much speculation, considerable financial loss, especially to those states like Kansas, where the full appraised value of an animal reacting to the tuberculin test must be paid when no lesions are found and from information from various sources we are sure that this amounts to a considerable sum annually.

The fact of not finding tubercular lesions in a reactor also results in much dissatisfaction to owners, as well as discrediting to a certain extent the reliability of the tuberculin test.

It is our opinion that when a positive reaction results from the tuberculin test, that there must be, that there is always tuberculosis present.

Finding it, however, is the crux. It must be remembered that the most minute active lesion, no matter if no larger than a pinhead and even if only one such lesion is present will give a positive reaction to the test and it must be evident to any rational man that to find so small a lesion in so large a mass of material as a bovine or other carcass is well nigh impossible.

We recall a discourse on the subject of tuberculosis, especially relating to reactors, illustrated by beautifully clear lantern pictures which was given by Doctor Veranus A. Moore at the veterinary conference at the Iowa State College in Ames, several years ago and at the time we wished most strongly, that it might be the good fortune of every veterinarian in the land who has anything to do with tuberculosis, tuberculin testing or postmortem examinations of reactors to see those pictures and hear Doctor Moore's discussion of the same.

It was most elucidating and clarifying, as the pictures showed a number of cases where the lesions were so slight that they could easily have escaped the usual examination even when such was fairly carefully made. The one outstanding feature of the discourse and pictures was one case wherein the cow had given a positive reaction and whose carcass had, as expressed by Doctor Moore "been cut up into mince meat" by a number of competent men and yet no lesion could be found and Doctor Moore and his assistants were about to give it up as a "no lesion case" when one veterinarian in rehandling some of the pieces, accidentally felt or noticed a very small nodule on one of the animal's coronets, so small that it could not be identified as being tubercular until examined microscopically.

Along these lines we wish to call attention to the splendid article on "Lupus or Tuberculosis of the Skin" by Dr. L. S. Campbell of Topeka, Kan., which appeared in the March, 1921, issue of VETERINARY MEDICINE, wherein he so ably points out another avenue whereby tubercular lesions frequently escape the eye of the one making the postmortem examination. We think no one in any way associated with tuberculosis work can afford to miss this article.

Thus we firmly believe that a *positive* tuberculin reaction always means that tuberculosis is present.—E. L. Q.

An Epoch in Veterinary Medicine.

There is a large degree of self-satisfaction to the man who "does something" or at least who aids in "doing something."

Veterinary medicine has just recently entered an epoch-making period just as great and just as important as the discovery of bacteria as a cause of disease. In fact, we think it is the greatest discovery in veterinary medicine since the epochal period wherein it was discovered that germs cause so many of the diseases and ailments of the living organism, whether in the human or the lower animals.

In Dr. Maurice C. Hall's article in the department of parasitology in this issue of VETERINARY MEDICINE, he so ably, so clearly and so logically explains this discovery that we will not attempt any elaboration on it, except that we desire to direct the attention of the veterinary profession to a careful perusal of the article.

Give the careful, thoughtful study that this article so fully deserves, and thereafter, now that your attention has been called to the fact that parasitic worms or their larvae may act as inoculating media in the transmission of germ

diseases, do your part, even as practitioners, in the furtherance of the work, by closer observation as to the relationship of certain worm parasites and certain diseases. Do not stop there, however; if you have observed such a relationship existing consistently, make such observation known to the veterinary world by writing a full account of it to VETERINARY MEDICINE and thereby helping your profession and taking your place among men "who do something."

We only hope that it may be the good fortune of every veterinarian in the land to read Dr. Hall's article so that none may say "he never had a chance" to number himself among the up-to-date men of the profession. Furthermore, we cannot perceive but what the reading and comprehension of Dr. Hall's article is certain to stimulate the profession to a more profound study of parasitology, both as relates to the internal and external parasites.

In our editorial in the January issue of VETERINARY MEDICINE, under the caption, "Parasitology Important to the Practitioner," we called attention to the close co-operation existing between parasites and bacteria in causing disease.

We again most emphatically suggest that you carefully read, digest and assimilate **Dr. Hall's** article in this issue. In fact, you cannot afford to miss any of his articles.—E. L. Q.

Horseman Recognize Value of Scientific Sterility Treatment.

Kentucky horsemen, sharp, shrewd and expert as they are, but like horsemen, frequently hampered by tradition, have been a little slow in recognizing the value of scientific treatment for sterility in mares. However, they have at last awakened to its great advantages, especially those in the celebrated blue grass region in the vicinity of Lexington, the native heath of the standardbred and the thoroughbred race horse of America, the animal that has furnished the sport of kings, or rather the sport of "his royal highness, the American citizen."

A group of men in the aforesaid district, owners of valuable but sterile brood mares worth thousands of dollars and representing some of the best racing blood in the world, having seen the light of day, engaged the services of Dr. J. F. DeVine of Goshen, N. Y., who enjoys a national reputation in his knowledge relating to such matters.

Dr. DeVine during the latter part of February spent a week in treating sterility in a number of racing mares in the country adjacent to Lexington.

In all of the cases he naturally worked in collaboration with the local veterinarian, giving him the necessary instructions for the continuance of the treatment.

Such a visit and service as rendered by Dr. DeVine can only redound to the best interest of the local veterinarians, as it is sure to stimulate a greater call for such service, and the local veterinarian made proficient in the work by his observation of the treatment as given by Dr. DeVine should and will profit thereby.

BOOK REVIEW

Manual of Veterinary Physiology.

By Major-General Sir Frederick Smith, K. C. M. G., C. B. Fellow and honorary associate of The Royal College of Veterinary Surgeons, London, Eng., Formerly Director General, British Army Veterinary Service. New Fifth Edition. Pages 892; illustrations, 273. Published by Bailliere, Tindall & Cox, London, Eng. Cloth, $7.50.

This work, completely revised and containing nearly 100 more pages than the previous edition, is the only book on veterinary physiology written by a veterinarian and is without doubt the most complete and thorough treatise on the subject.

It is essentially a veterinary and not a comparative physiology. It treats of physiology not only from its theoretical and scientific aspect but from the point of view of clinical utility, which of a necessity commends it to the practitioner of veterinary medicine. Thus, the requirements of the student and practitioner have been fully met, and every opportunity has been taken in the text to point out the clinical application of physiological facts. Inasmuch as "pathology is physiology out of health," it is plainly evident that every practitioner requires just such a work.

To those who are studying the deficiency diseases the book will be of the utmost value, as the chapter on "Nutrition" is especially complete even to the inclusion of a thorough discussion of vitamines. Every other department of physiology is dealt with in an equally thorough, scientific and up-to-date manner, with the exception of that of the endocrine glands, which is somewhat incomplete as regards present-day knowledge of the function of some of them.

The style of the book is splendid; it is well bound and printed on thin opaque but tough paper and in an easily read type which does not tire the eyes. The illustrations are profuse and high class.

Rinderpest, Politics and Superstitions

By GEORGE BALLARD BOWERS, Escondido, Calif.

RINDERPEST was about to exterminate the cattle of the Philippines when it was brought under control by American veterinarians. They tried two methods of control, by immunization and strict quarantine. Immunization was found to be too expensive; therefore quarantine was the method used. Thousands of armed constabulary and scouts were used to obtain the desired result.

In 1913, a new governor-general heard many complaints against strict quarantines. He found the Bureau of Agriculture directed by an American in whom all authority for the control of epizootics was centralized. The new executive, believing agriculture to be most vital to the Filipinos, thought them most competent to judge its necessities and to combat its enemies. One of his first acts was to appoint a Filipino to direct the Bureau of Agriculture, but at the same time took away all his authority. The responsibility for the suppression of rinderpest was turned over to the provincial authorities, all Filipinos.

It followed as a natural result that the American veterinarians lost all prestige. Even the Filipino director had no means whereby he might check the results of the new plan. As the responsibility for the suppression of the disease rested solely with the Filipino provincial officials, it was hardly to be expected that they would shout their failure from the house tops. The director of Agriculture could publish only such information as came to him through official channels.

American veterinarians became helpless. They could do nothing but advise and exercise only such authority as Filipino officials saw fit to delegate and, moreover, it had become extremely unpopular for any Filipino to seek or accept the advice of an American.

Failure of Decentralization Scheme.

Of the many failures of the decentralized scheme, the following are chosen at random.

In February, 1916, the Director of Agriculture informed the press of Manila that Zambales Province was free from rinderpest, while a special report of the same month by senior inspector of the constabulary, Captain Velasquez, a Filipino, stated that in a journey of twenty miles along the beach he had encountered 185 dead buffaloes unburied. This translated into American conditions would be equal to 185 teams of horses scattered along twenty miles of Kansas turnpike. A buffalo is as important to the Filipino farmer as a team of horses is to the American farmer.

During the month of August, 1916, conditions in Zambales had become so critical that the Director of the Bureau of Agriculture interfered, notwithstanding his lack of authority. During this month 553 buffaloes had died and 310 others were sick at the end of the month. This condition was known to have existed more than a year before the Bureau of Agriculture took official notice. Several thousand were known to have died before any effort was made to stop the epizootic. Think of the enormous loss to a province of less than one hundred thousand inhabitants, where a farmer's earnings in one year would scarcely equal the value of a buffalo.

Disease Infects Three Municipalities.

In the province of Laguna, constabulary soldiers were posted for quarantine on March 10, 1917. On June 15, in my capacity as inspector of constabulary, I found the guards without any instructions whatsoever; none had been received from the local authorities. I ordered the Filipino officer to demand at once a copy of the provincial regulations. It was found that none existed. A month later when instructions were received it was discovered that the regulations permitted animals to be transported to outside villages under such conditions as to make the presence of the guards a farce.

At the time the guards were sent, the disease had infected three municipalities, with 22 deaths and 43 sick. On April 1, 134 animals had died and 225 were sick in the three municipalities only. At this point the officer in command of the guard gave up the count as nothing was being done to save the living.

By June, before any action had been taken by the provincial officials in Sinoloan, another part of the same province, every buffalo had died, 300 within the village itself. This case was brought to the attention of the Bureau of Agriculture by the Filipino press. I asked a complaining owner when I visited the municipality why he had not complained directly to the executive secretary. He replied with a shrug: "What is the use?"

In 1916 Governor Hilado of Occidental Negros

accused the American veterinarians of poisoning the buffaloes of the province. I use the term poison as a synonym of bewitch; it has this meaning in all reports of Filipino officials. The governor employed several detectives to watch the American and his party. There resulted considerable controversy and the Americans barely escaping violence. The details of this affair appear in official records. Control of the epizootic was lost in the meantime and many of the European sugar planters were driven into bankruptcy as a consequence of the loss of their animals.

What was true of the provinces mentioned may be said of a majority of the forty-eight in the archipelago.

Politics and Superstitution Thwart Veterinary Measures.

It has been shown how the veterinarians failed because of the politicians; it may be well to explain why the politicians did nothing. It seems inconceivable to the occidental mind that a people should combat all measures to save their own property. Of course an elucidation of this condition would not have helped matters but now that the American veterinarian is out, it may be interesting to know why the politicians failed to apply the simple remedy, quarantine.

Filipinos combat rinderpest prevention and control for the very simple reason that according to their belief there is no such a condition as sickness in man or animal. A buffalo is not sick because he has a diseased condition of the body but because the animal is possessed of an evil spirit, and to cure the animal it is only necessary to expel the evil spirit or break his spell. The Filipino farmer considers the sacrifice of a white rooster under a banyan tree by the witch-doctor far more effective than quarantine.

What need of quarantine and guards has the believer of such doctrines? Neither can curb the power of the denizens of the spirit world. This explanation may appear ridiculous, but is there any other way to explain the Filipino's refusal to save his own property?

The Filipino is a fatalist. The fatalist has no use for sanitation and doctors. Is it not natural for him to maintain the same belief regarding his buffalo? If the gods have pre-ordained his life, why should they not look after his animals? He calls the witch-doctor when he is sick, then why should the same witch-doctor not cast the devils out of his pet buffalo? Because a Filipino is governor of his province is no reason for saying that he is not an animist and a fatalist. Man believes what he feels rather than what he knows. Many people of Zambales may have known that quarantine was desirable but their attachment to their ancient belief prevented action on their knowledge.

While many tractors have been put to use in the islands, production is on the decrease. Not half enough rice is raised to feed the people. This condition is due to the constant loss of cattle through preventable rinderpest. What will happen if the dread disease is not controlled within the next five years? No one would dare hazard a guess. The few Americans in the Philippines are without authority. It is up to the Filipinos to save themselves. The outlook is gloomy.

Luxated Vertebra in Dog Successfully Reduced

By E. B. BREITINGER, Bakersfield, Calif.

ONE of the most delicate operations on record, and perhaps the only one of its kind, was performed on an Airedale dog belonging to Paul J. C. Derkum of Bakersfield, Calif., in that city Feb. 13, 1921.

The dog, "Toughy," is a great pet and has many friends all over Kern county. While playing in the street he caught sight of a cat and gave hot pursuit, colliding, while at top speed, with a rapidly approaching automobile. The impact was so great that the dog was hurled to the street in an apparently lifeless condition. He was picked up and placed in another machine and then hurried to a small quiet room in the automobile service station operated by his master.

While friends advised putting the dog out of his misery, Mr. Derkum determined to make an effort to save his life. "Toughy" had begun to show signs of great distress, though he could move only his forequarters; from the middle of the back posteriorly he was apparently paralyzed.

Dr. J. E. Van Sant, veterinarian, was called, and from the examination he made, diagnosed the injury as a dislocation of the spine, and advised an X-ray examination. Dr. W. P. Scott, a roentgenologist, took several pictures of the region of the injury, one of which showed con-

Airedale Dog with Dislocated Vertebra—Dr. J. E. Van Sant with Syringe About to Inject Twilight Sleep Solution; P. J. C. Derkum (Owner) at Head and Dr. George Sabichi at Hind Quarters.

clusively that the tenth vertebra at the third to the last rib was out of line one-half inch, pinching the spinal cord and causing paralysis.

In the meantime, Dr. George Sabichi, a Bakersfield physician, had heard of the accident, and the dog being, as he said, "a personal friend," he went down to the service station to make inquiries. Learning the particulars of the case, he suggested to Dr. Van Sant, who was puzzling over a very difficult but possible method of saving the dog's life, that he administer "twilight sleep" for the operation.

This, both doctors declare, is without doubt the first time the twilight-sleep opiate has been administered to an animal. Two doses were given in the following proportions: Morphine sulphate, one-fifth grain; Scopolamin, one-fiftieth grain, at intervals of one hour. The dog went to sleep very easily and quickly.

Then came the difficult part—to put the vertebra back in place. To reach it by a surgical operation was extremely hazardous because of the location of the injury. There was one alternative, which was to stretch the spinal column sufficiently to allow the vertebra to snap back into place. Two men grasped the front part and two the hind quarters of the dog. There was a long steady pull and suddenly with a pop like a pistol shot the deed was done. This was early in the afternoon. About midnight the dog came from under the influence of the drug and whined for his master. His little stumpy tail wagged feebly and he responded to reflex action, showing that paralysis had disappeared.

The region of the injury was kept in alternate hot and cold packs to provide nerve stimulus and to prevent possibility of a blood clot. The length of the body was enclosed in a burlap sling with a splint to hold the vertebra in place. At frequent intervals the dog was suspended in the sling with his feet resting lightly upon the surface of the table to allow free circulation of the blood.

A second X-ray picture was taken Monday morning. This showed the spinal column to be in perfect alignment, proving that the operation was entirely successful.

"Toughy" was pronounced "out of danger" on the second day following the operation, although Dr. Van Sant said it could not take less than three weeks for him to recover completely from the effects of such a serious injury. Each

Roentgenograph Showing Dislocated Dorsal Vertebra (Airedale Dog).

Roentgenograph Showing Dislocated Vertebra Reduced and in Perfect Alignment (Airedale Dog).

day showed more activity and signs of life in the injured region.

Interest in the case was widespread among medical men because of the unique method of treatment.

Comment: We have to take issue with one statement in the foregoing article and that is that this was the first time that twilight sleep was ever used in canine practice. We take this issue because I personally used it some years ago when it first came into prominence in human practice in parturition. I also know that Dr. C. A. White used it some years ago, and we still use it in properly selected cases. As a succedaneum for general anesthesia, however, we do not favor it on account of the time required to gain its maximum effect. In the abovementioned case, however, there was good reasons for using it as the danger and shock from the two drugs used was undoubtedly less than there would be with ether or chloroform or any of their combinations.—E. L. Q.

Use of Bovine Abortion Bacterial Vaccine*

By R. M. STALEY, Philadelphia.

IT IS not my purpose to present a technical or scientific discussion of infectious abortion, and it is hoped that these comments shall be received as from a practical veterinarian to practitioners. The material submitted is not new unpublished facts but rather a new *thought* or *plan* for the application of the knowledge we now possess.

Much very good work has been done by veterinary investigators, but we all appreciate the fact that considerable work remains to be done before a successful plan for the eradication of infectious abortion can be advanced.

At the present time the practitioner who has established a diagnosis of infectious abortion is almost helpless. He can treat the results and sequelae of the disease but what we must do is aim at the cause and prevent the actual abortion, if possible.

The work of such men as Stockman, Williams, Schroeder, Cotton, Ward, and others has brought forcibly to our attention the far-reaching and disastrous results of infectious abortion and its sequelae. This work has also impressed upon the profession its responsibility in controlling the disease.

Unlike tuberculosis, infectious abortion is not known to be harmful to human beings. Hence, the general public is not particularly interested in its control, and the work will have to be carried out by herd owners and the veterinary profession without the support of public sentiment and probably without the appropriation of specific public funds in any great amount. The task is primarily an individual herd proposition to be handled by the individual veterinary practitioner.

*Read before the Maine Vet. Med. Assn., July, 1920.

No problem of any great importance is ever solved without many apparently conflicting statements being made and many apparently conflictflicting conclusions drawn by various investigators. This has certainly been true with reference to the work done on infectious bovine abortion.

Some Convincing Conclusions.

Without attempting to review the work done on this disease, we may feel justified, from a practitioner's standpoint, in accepting the following:

1. The conclusion of the 1919 committee on Infectious Abortions of the U. S. Live Stock Sanitary Association "that infectious or contagious abortion disease of cattle has, as its primary, essential, specific cause the Bang bacillus of infectious abortion."

2. That a diagnosis of infectious abortion may be established by the agglutination or complement-fixation test or by the occurrence of actual abortions in a herd.

3. The statement by Schroeder and Cotton "that the maximum time the uterus was found infected following an abortion was fifty-one days."

4. The work carried out at the U. S. Experiment Station, Bethesda, Md., which proved that living Bang bacilli injected into the non-pregnant uterus disappeared in a short time. This work demonstrated that the uterus must contain embryonic tissue to be a favorable site for the existence and propagation of the Bang bacillus.

5. The repeatedly observed fact that frequently cows acquire an immunity following a number of abortions.

6. The work of Pasteur on anthrax in 1881, whereby he proved the superiority of vaccines prepared from living attenuated organisms in

conferring immunity, has stood the test of time, and is the basis of our hope in the control of infectious abortion. Experience as practitioners has taught us that:

1. Medicinal remedies are of no value in the prevention, cure or control of infectious abortion.

2. Under average farm conditions it is impracticable to control the disease by isolation and sanitation.

3. It is impracticable for the average nerd owner to establish an immune herd by depending on acquired immunity and the raising of a sufficient number of heifers to keep his milking line supplied.

Herd-Owners' Interest Purely Pecuniary.

The average herd owner is not interested in infectious abortion as a disease. His interest is purely pecuniary—the disease causes him great losses. The fact that we do not know all that is to be learned about the disease and its eradication is lamented by the owner; but what he is most interested in, and what the practitioner should direct his present attention to, is the prevention of the loss of calves and the resultant diminished milk supply.

The herd owner is interested in having more calves carried to maturity, more healthy calves developed into profitable animals, an uninterrupted milk supply, less calf scour, calf pneumonia, retained fetal membranes, sterility, metritis and other usual profit-destroying results of infectious abortion.

From our present knowledge and experience it is believed that we are justified in turning our efforts, with some assurance of gratifying results. to the promotion of herd efficiency, as judged over a period of one or more years.

Success in increasing herd efficiency by the use of bacterial vaccines depends largely upon the use of the proper vaccine on the proper individuals at the proper time.

The Proper Vaccine.

The use of killed cultures or bacterins has left much to be desired. These bacterins have failed to prevent the occurrence of abortions with any degree of regularity or to any great extent in a given herd. Their proper use is limited to animals in which pregnancy has been diagnosed. If such animals and their calves are very valuable one may be justified in using the bacterins.

Scientific knowledge and practical field results show that the use of living vaccines in the control of this disease is based on sound principles.

The first living culture or vaccine used to any considerable extent is known as the "Stockman Vaccine." It consists of a suspension of the living bacillus of infectious abortion of cattle grown on agar for a sufficient time to give a maximum number of organisms. The organisms are grown in equal sized bottles and immediately before injection, sufficient physiological salt solution is added to the growth to wash the growth free from the agar. This suspension is injected as one dose.

When injected, the size of the dose and its richness in living bacillus of Bang give rise to considerable local, and sometimes systemic reaction.

In order to secure the advantage of the use of living cultures and at the same time have a product that will not cause such severe reactions, a sensitized living culture or vaccine has been prepared.

Preparation of Sensitized Vaccine.

A sensitized vaccine is prepared by growing the bacillus of infectious abortion on culture media for a period sufficient to obtain a maximum growth, which is then harvested. This growth is concentrated by centrifuging and then emulsified in bovine serum rich in specific antibodies for the particular strain to be sensitized. The serum is left in contact with the organisms for at least twenty-four hours, during which time it is kept at refrigerator temperature.

During this period of sensitization the immune bodies contained in the serum attach themselves to the bacteria. After the period of sensitization the bacteria are washed free of the serum, centrifuged and diluted with physiological salt solution to 25,000 million bacteria per cubic centimeter. Twenty c.c. of this dilution is considered a dose. Bacteriological tests are made of the vaccine to make sure that the bacteria are alive and active.

The immune serum used in the sensitization of the bacteria, for the preparation of a sensitized vaccine is prepared by injecting cattle with massive amounts of the bacillus of infectious abortion of cattle over a long period of time.

Proper Animals and Proper Time to Treat.

The proper animals to treat are all non-pregnant animals in the herd. Pregnant animals should not be injected.

The proper time to treat is at least two months before breeding. Virgin heifers should be treated, turned out, and not added to the herd until after having calved. Full time cows and those that have aborted, may be injected as soon as they have cleaned and the uterus has returned

to as near its normal condition as possible. Treatments carried out in this manner do not interfere with regular breeding and occasion no loss of breeding time.

Sensitized vaccines must not be regarded as the long looked for abortion panacea, and results must be judged only after their proper use in the same herd over a period of years. Neither will the use of the living cultures lessen the importance of sanitation and the proper treatment of such conditions as retained fetal membranes, metritis, sterility, etc.

To summarize: It is believed that the plan of operation as outlined above is worthy your consideration and application when you are called to a dairy herd because of an abortion. You must give your client a working basis upon which he can hope to raise his herd efficiency.

Mode of Procedure.

The steps to be taken are:

1. Establish your diagnosis.
2. A general and thorough cleaning and disinfecting of the premises.
3. Proper isolation and care of recent aborters.
4. Injection of all non-pregnant animals, including heifers, provided they are not to be bred within two months.
5. Injection of all fresh cows as soon as they have cleaned and returned to as nearly a normal state as possible.
6. Establish maternity stalls where all cows about to calve are to be placed.
7. Proper use of the Albrechtsen treatment as improved by Williams.
8. Repeated and regular cleaning and disinfecting, especially of maternity stalls.

Rising Importance of the Goat—Anti-Bleat Operation

By R. T. WHITTLESEY, Los Angeles, Calif.

THE milch goat is coming into its own, and no longer is it the especial pride of the jokesmith and comic cartoonist. It is little over a dozen years since the first registered milch goats were imported from Switzerland, the home of the high-grade goat. No other country keeps such careful records and registrations.

The two principal breeds are Toggenburgs and Saanens. England has produced a breed termed Nubians whose ancestors came from Africa; in some respects they are very superior milk producers, but do not come up to the others mentioned in quantity. The best specimens of milk goats produce a milk running over 7 percent in butter fat.

At the time of the first importation they were spread out over the country and used to improve the common stock, a few coming direct to California. For some reason the people in the eastern and middle states did not develop them as in California, either in numbers or quality. At the present time this state (California) has as many milk goats as the remainder of the United States, and 75 percent of those in California are in the southern half-dozen counties, Los Angeles predominating by a very large majority.

Goat milk is nearly a specific for human stomach troubles. Dr. Wyley says it is next to mother's milk for raising babies.

I started out to write a short article on an operation for the stopping of the infernal nuisance of a bleating goat, but there is so much preliminary leading up to the reason for the operation that I am afraid it will turn out to be what my friend Merillat would call a symposium on the milk goat. But there must be a reason for the operation aside from the noise the goat makes. If the goats I am writing about had no more value than the common goat of a few years back, the operation would be simple; cut its throat from ear to ear, make mutton of it and let it go at that. But when it happens to be a pure-bred Toggenburg doe with such an udder as that shown in the accompanying illus-

Toggenberg Doe, a Fine Type of Milk Goat.

tration, a doe giving six quarts and more at her flush and keeping well up to it for several months, it is a different story. A doe like that has an actual selling value of $200 to $400 as a milk producer and breeder, but if she should be a loud persistent bleater her value is off $100, as she can never be kept in a close settled town or where there are nervous neighbors.

Rapid Growth of the Goat Industry.

The veterinary profession outside of California and a few locations in some eastern and middle western states have no idea of the rapid growth of the goat industry and how soon they will be called upon to treat diseases in this very attractive little animal. How many readers of VETERINARY MEDICINE could pick out the Toggenburgs from the Saanans in a mixed herd or know which is the best dairy animal? How many could distinguish a Nubian from an Angora, or know the period of gestation? Not one in fifty can answer this last question.

You may laugh at the idea of doctoring goats, but it is coming fast. Ten years ago there were very few pure-bred goats in southern California, and now there are hundreds. Many breeders are getting rid of everything else and breed nothing but pure-breds. Four years ago a buck at a Los Angeles goat show sold for $750, and many went to look at him. A little over a year later a buck was sold for $1,500, and last fall one of the oldest breeders in this section of California paid $2,500 for one, and said he paid it because he believed him worth it. The best does sell for $150 to $400. They produce four to six quarts of milk, which sells for 30 to 40 cents per quart, and it costs less to produce than cow's milk.

Don't you believe that the owners of such animals will pay for having them doctored? But where are your textbooks, and how many lectures have you heard on the goat and its diseases?

During the war there was no importation of new blood and even now there is a quarantine against direct importation, on account of foot-and-mouth disease. The importer must whip the devil around a stump by shipping first to some country that is not in quarantine, like Cuba or Porto Rico, and from there into the United States. This makes importing expensive and dangerous. One shipper that started from Switzerland with 100 goats, after nearly a year's time got to their destination in Nebraska with 60 of them; their catalog price is $800 to $1,200. Several other smaller herds have been imported with better success.

It is not in America alone that the goat industry is increasing so fast and attracting so much attention, but it is the same in all civilized countries, and it has always been a great industry in uncivilized countries. In Europe the goat has long been a part of the family, but in the United States it is comparatively new, at least in its present form of the high-grade milk goat. There is good reason for it, the extremely high price of all dairy products causing families to look for a cheaper source for their milk and butter. The care and responsibility required for a cow is greater than most American women care to assume, while the nanny goat fills the bill exactly. If she is the foster-mother of the puny child it makes no difference, for the family does not have to stay at home on account of the milk supply. The goat climbs onto the running-board of the flivver and is at home wherever it stops and she can always find plenty of feed. It may sound funny, but I have seen dozens of camping outfits during the past summer where the milk goat was about the most essenital part of the equipage.

To Be the Universal Source of Milk Supply.

The greatest reason of all for the goat becoming the universal source of milk supply is its almost complete immunity from tuberculosis. In the past two years out of nearly 275,000 goats slaughtered for meat under federal inspection only two were found tubercular. In Los Angeles there is a monthly publication, the "Goat World," started six years ago by a goat rancher, which at the present time has 9,000 paid subscribers, its subscription list practically covering the entire world. In the past year it has published more articles and answered more questions on goat diseases than all veterinary publications combined, in my opinion. The testimonial letters that are published in that journal about the puny babies that have been made strong and healthy and the men and women with weak digestion who have been cured by drinking goat's milk is indeed impressive. There are no textbooks on goat diseases of any value in the English language, but there must be some foreign ones that could be translated; they are certainly needed. Every college should have a chair on goat pathology next session.

Last fall the city of Chicago purchased a foundation herd of high-grade Toggenburg does and a pure-bred buck in the suburbs of Los Angeles,

and shipped them through to Chicago by auto-truck. They are to be used as a foundation for a herd for its tuberculosis institutions.

Operation to Stop Goats from Bleating.

The operation to stop goats from bleating is very simple. Fasten the goat on its back in such a manner that all fluids will run forward out of the nose and mouth, and not back toward the lungs. Clip and sterilize the skin, and then introduce a large human tracheotomy tube in the trachea at about the upper third in the usual way. A horse tracheotomy tube is too large. Then, with a sharp pointed scalpel, cut straight through the crico-thyroidean ligament at its anterior border and straight back on a median line and through the first tracheal ring. Tampon with gauze the trachea until all breathing is through the tube. No anesthetics are necessary, but they should be used. Cleanse the throat of all blood and mucous, and grasp the vocal cord with a pair of forceps so that it may be held firm but not stretched too tight; extirpate the vocal cord with a long pair of curved scissors (Mayo pattern preferred). That ends the operation.

An assistant is necessary to hold the incision in the trachea open with a pair of retractors and have the goat in such a position that the light will shine into the wound. No stitches are necessary anywhere. Put a roller bandage around the goat's neck so that the wound external and internal may be examined. The point of extirpation of the vocal cords usually heals very rapidly; sometimes they may be touched up with tincture of iodine after a few days, but usually it is not necessary.

Progress of Tuberculosis Eradication in Nebraska

By W. T. SPENCER, State Veterinarian, Lincoln, Neb.

SOME idea of the progress made in tuberculosis eradication in Nebraska can best be shown by a comparative survey of the work from its inauguration down to the present time. In August, 1918, the initial step was taken to systematize the work, at which time two state and two federal veterinarians assumed the task of education, mainly blazing the trail, as it were, for that which was to follow.

At the outset the interest taken by breeders was anything but encouraging, those in charge being compelled almost to beg the more influential of the live stock men to participate, so skeptical were they of the real benefits to be derived. Prior to this time little tuberculin testing had been done, save where necessity required, as for sales or interstate movement to comply with federal and state regulations.

At the close of 1918, after weeks and months of untiring effort against almost unsurmountable barriers, those in charge were able to point with pride to a record of ten herds tested on the co-operative plan. As regards numbers this was not much of a showing, but to the men who did the work it meant everything, for the way had at least been opened.

With the dawn of 1919 it was found that through educational propaganda and results obtained from the few herds tested that a great public sentiment was awakening a condition which, when favorable to any project, is not soon to wane and will sweep it on to a successful termination.

Fund Appropriated by State to Carry on Work.

As a result the legislature of 1919 set aside a fund of $75,000 for the payment of indemnities and operating expenses in co-operation with the federal government. This fund available, it was but a short time until a steady stream of signed applications was flowing into the state and federal offices in every mail, exceeding all expectations and taxing the ability of those in the work to keep abreast of the flood.

Veterinarians, both state and federal, have been added as the work developed, until twelve men giving their entire time to this work are now employed. The records for the two-year period just closed show that 497 herds are under supervision, with 100 signed applications on file.

Some interesting specific cases to show the good which has been done can be gained from the following:

At a local dairy in the vicinity of Lincoln, 104 head of pure-bred Holstein cattle were tested. On first test 22 reactors were taken from the herd. On a second test, six months later, 8 out of 85 were classed as reactors, and on the last 1 animal out of the 117 tested gave a suspicious reaction.

Another pure-bred herd in an adjoining county on first test revealed 5 reactors out of 35 head;

on the second test 3 out of 28 reacted; on the third test 1 out of 32 reacted, and on the fourth test no reactors were found in the 40 head.

Still another case worthy of mention was in a herd of 124 head located in the central portion of the state, 35 of which reacted on first test. On second test 11 out of 115 reacted, and on the last test but 1 of the 103 treated gave a positive reaction.

Similar records have no doubt been made, but these have been mentioned merely to illustrate what systematic tuberculin testing will accomplish.

Accredited Herd Plan Meets Disfavor at First.

In the beginning there were a few practicing veterinarians who looked upon the accredited herd plan with disfavor, believing in all sincerity that the state and federal governments were establishing a system to relieve them of work which was rightfully theirs. Such opposition has now almost entirely disappeared and in its place has come an enthusiastic desire on the part of everyone to lend all possible aid in detecting the dangerous reactors.

Previous mention has been made of the fact that little tuberculin testing was done before the advent of the co-operative plan, but soon following, due to the ever-increasing public sentiment, there was enacted a law effective July 17, 1919, in the state of Nebraska, requiring that all cows from which milk and cream are sold to be consumed in the raw state must undergo a yearly tuberculin test.

This law is enforced by the state dairy department, the local practitioners making the tests, and has been the means of locating many badly infected herds showing as high as 30 to 50 percent of the entire herd reactors.

No funds have been available for the payment of indemnities under this law, but even with this handicap over 40,000 milk cows were tested in the state during 1920.

A determination on the part of persons in all walks of life to rid the state of bovine tuberculosis at the present time is indeed a contrast to the 1918 sentiment, and is manifest in a bill which has been introduced in the present legislature now in session providing for an appropriation of $300,000 for this work alone. This bill has been approved and is being supported by national, state, county and civic societies, and if passed will provide indemnifying funds to pay for all tubercular cattle slaughtered in the state that come under the established rules for such payment.

Nebraska has still another regulation for the protection of the breeder which provides that all pure-bred cattle imported into the state must be subjected to a retest 60 days from the date of their arrival.

A number of reacting animals have been found as a result of this regulation which, had they been allowed to go untested, in all probability would have done untold damage to some of the choice pure-bred herds of the state.

Another phase of the progress not to be overlooked are the restrictions on the sale and distribution of tuberculin which has also been provided for in a bill now pending in the state legislature.

It is a known fact that tuberculin in the hands of ignorant or unscrupulous persons has caused an economic loss of thousands of dollars in the past, and in view of this fact and to guard against a continuance of such practices it has been deemed advisable to seek legislation to end it.

An important part of the work which unfortunately is too often slighted is the cleaning and disinfection operations following the removal of reactors. Only until the last few years has any particular attention been given this part of the work, the average practitioner making few suggestions of its importance.

Disinfection a Prime Factor in Eradication.

The majority of owners even now entertain the idea that the only requirement is to rid the herd of tubercular cattle, entirely unmindful of the serious condition that may be present from virulent tubercle bacilli infesting food boxes, mangers, and, in fact, every portion of barns and lots to which the tuberculous animals have had access, disregarding the fact that a proper disposition of contaminated litter is a very important feature in the eradication of tuberculosis. For this conception of the problem the cattlemen are not entirely to blame, as their information is generally gathered at random from other people who profess to know and who have a very indefinite idea as to the methods to be followed In many cases they will quote some practitioner as saying that they do not believe in this disinfection business; to throw open the doors and windows for the action of the sun is the best that can be done. To a large extent this is very true, if they persist in having the disinfectant scattered, as they call it, on the accumulated litter, filth and manure. They forget that many cattle barns are inadequately supplied with either doors

or windows to furnish proper ventilation, let alone the possibility of permitting the sunlight to enter in any volume to be effective.

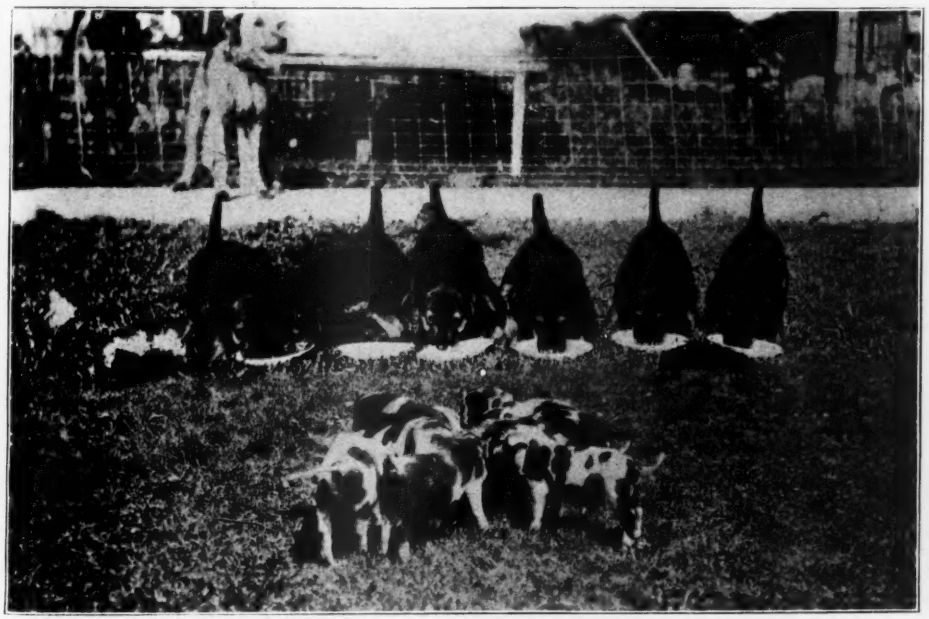
In order to make real progress in accomplishing anything of value it becomes necessary to abandon the critical state of mind and approach the public in a helpful and educational attitude. If we are to be effective in the eradication of tuberculosis it is very necessary that we create a wholesome respect for everything that is of any importance in this work.

Veterinarians Can Create Respect for Tuberculin Testing.

This gives rise to the question, what can the veterinarian do on making the test? Many cattle owners who are not fully convinced of the actual value of the tuberculin test often submit their cattle, through the force of public opinion rather than through a knowledge of the actual value as a health measure or the economic gains to be derived therefrom. This man's attitude, whether it shall be favorable or that of a chronic knocker, to a large extent depends upon the veterinarian. If the veterinarian approaches his work in a spirit of confidence, as well as a just pride in his professional capacity, he can create a wholesome respect for the eradication of tuberculosis and thereby induce the owners to be more thoroughly appreciative of the necessity of following all suggestions in regard to the sanitary requirements. Having established his confidence in the reliability of the tuberculin test, he will gladly co-operate in the enforcement of all necessary sanitary precautions.

The problem of the sanitary requirements may be classed in two divisions, the preliminary the final factors of which are the mechanical or physical and the chemical means employed. Of the two we shall regard the first as of the greatest importance. That is the application of labor to remove the filth and manure so that it will be possible to apply a disinfectant to the infected surface. It is a waste of time and even impracticable as well as an expensive proposition to saturate the litter and manure with any reliable disinfectant.

When tubercular cattle are found it is very important that the owner shall be impressed with the importance and need of an early action for cleaning the premises, and under this condition



Mess Call—Note the Mess Sergeant on Duty.

From the Kennels and Piggery of E. B. Rader, M. D. V., Oxford, Iowa, Showing Airedale Terrier Pups and Spotted Poland-China Pigs.

someone should initiate the need for action so that we shall get something started immediately. The veterinarian making the test is logically the man to emphasize the importance of having the preliminary part of the sanitary requirements observed.

Thorough Cleaning of Premises Necessary to Prevent Infection.

It is very necessary that a thorough cleaning of the infected premises be undertaken in such a manner that all infected material as straw and manure shall be removed and scattered in the field or moved to a place not accessible to other live stock. This should be done immediately on the removal of all tubercular cattle, so that it will be possible to have a clean place for the other cattle at the earliest date.

In the cattle barns all hard and encrusted food or manure in feed trough or on the floor and walls shall be removed by scraping. This material may be softened by the aid of water to facilitate its removal, if it is done in sufficient time to allow the surface to become dry before applying the disinfectant. The dust and cobwebs on the walls and ceilings shall also be swept down.

The cattle yards deserve their full share of attention, depending upon the extent of infection in the herd, as far as the conditions of the season will permit. There is absolutely no excuse for leaving the manure in the yards from one season to another, and in some cases (the farmer) even fails to give an annual cleaning. In the feed racks all litter and manure should be hauled direct to the field. Last but not always the lease source of harboring the infection of tuberculosis is the common water tank or drinking troughs, which should also be given a thorough cleaning and then saturated with a reliable disinfectant.

A veterinarian, in order that he may be the most efficient in the conducting of tuberculin tests under all circumstances, must have had wide experience in the work and a deep sense of moral obligation, if the best results are to be accomplished. No less is this true of the inspector who is in charge of the cleaning and disinfection.

Bearing this fact in mind, one of our most proficient veterinarians has been detailed for this duty and gives his entire time to this phase of the work. It is well that he does, for excellent results have been obtained which, of course, have very materially facilitated the work.

To cope with the increased work in connection with tuberculin testing it has been deemed advisable to extend the use of the intradermal method to private practitioners as well as in the cooperative testing.

Knowing that the average practitioner has had little occasion to use this test in the past, and not being entirely familiar with its application and interpretation, district meetings are held at advantageous points over the state from time to time under the direction of experienced veterinarians, affording opportunity for those in attendance to see the test applied and to view the reactions. Thus with a thorough discussion of the method the veterinarian goes away with a clearer understanding of just what constitutes a reaction.

In view of the unlimited support and enthusiasm from all quarters it is anticipated that the coming two-year period will show a marked increase in progress over the same period just closed.

Extracting Porcupine Quills.

In the November journal I observed an article by Dr. Galbraith of Washington on porcupine quills in dogs, which was of considerable interest to me as I have had similar cases.

The treatment I use is a little different from that applied by Dr. Galbraith. If the animal is a dog I give a dose of morphine. After it takes effect I swab the quills for several minutes with a three to five percent solution of acetic acid. I use the acetic acid on the theory that the quill is of keratogenous structure and it must undergo a process of decalicification, because the quill is softened by the method.

This eliminates the secondary spurs on the quill and it is extracted with much ease and with little danger of the quill breaking off and leaving a portion embedded in the soft tissues to form an abscess.

I observed one case in a cow that had a mixup with a porcupine and came running in to town with its mouth foaming, frightening all the people in the neighborhood. I snubbed the cow's head to a post and on opening her mouth found quills stuck in it. The quills were given the usual acetic acid bath and were extracted without any of them breaking off.

Ely, Minn. J. E. THOMPSON.

I must do something to keep my thoughts fresh and growing. I dread nothing so much as falling into a rut and feeling myself becoming a fossil.—James A. Garfield.

Abstracts of Foreign Literature

Edited by A. EICHHORN, D. V. S.

Operation for Abdominal Hernia in a Cow.

J. MODIG, Svensk Vet., 1919, p. 76.

The author operated on a cow in advanced pregnacy for hernia which was the size of an udder, and was located 25 cm. anterior to the udder and about the same distance to the left of the linea alba. The abdominal rupture was about 10 cm. in length, but the opening had to be enlarged to about 30 cm., in order to allow the replacement of the prolapsed small intestines. The wound was sutured in three layers. Between the skin and abdominal wall he placed two boiled towels as tampons. The cow gave birth to a calf three days following the operation. The owner thought that parturition should have come only after three weeks, but from all indications it was not a premature birth. The parturition proceeded normally. The cow laid all the time on the operated side and the healing of the wound. proceeded without further complications.

Chemotherapy of Tuberculosis with Copper and Methylene Blue Salts.

PROFESSOR COUNTESS OF LINDEN. Bitr. z. Klinik d. Tuberk., 1919, Vol. 43, p. 84.

Linden established in her experiments that the treatment of artificially produced miliary tuberculosis of guinea pigs is favorably influenced by the administration of copper and methylene blue salts. By the influence of the copper treatment the acute process is changed into a chronic, and the active tuberculosis into a stationary form. At times the action of the copper is confined only to individual organs. The action of the copper depends on the quantity and the method of administration, as well as on the individual response of the treated animal. The favorable action of the copper treatment is the result of the intermixing of the body fluids with the copper, thereby causing an unfavorable media for the propagation of the tubercle bacilli which prevents their multiplication. The action of the methylene blue is practically the same, although not quite so pronounced.

The copper also proved effective as a prophylactic, although the unfinished experiments on rabbits do not as yet justify definite conclusions. In many of the cases the animals were protected against the subsequent infection with tubercle bacilli, or at least it protracted the development of the disease for a long time.

New Method of Separating Toxins and Particularly Tetanus Toxin.

LONDON AND ARISTOVSKY. C. r. Soc. de Biol., T. 80, p. 756.

Tetanus toxin does not adhere uniformly to all colloidal particles of the culture media, but only to such of a certain surface tension. In order, therefore, to concentrate the toxin, it is necessary to isolate these. This is possible by preparing a salt solution of a concentration to correspond with their surface tension and which results in the precipitation of only such colloids. Based on these facts, the authors developed the following method:

The cultures are mixed with a 17 percent ammonium sulphate, the precipitation is centrifugal, and an additional 1 to 3 percent ammonium sulphate is added to the fluid. The resulting precipitate contains the greatest part of the toxin. It is then dried in a vacuum, redissolved, and the process repeated until the potency is no longer increased. By this method a toxin was obtained which, on subcutaneous injection, killed mice in two days in doses of 0.00002 gram.

Contribution to the Etiology of Infectious Lymphangitis of the Horse.

DR. R. MANNINGER (Allatorvosi Lapok, 1920, No. 2).

The author examined in twelve cases the pus in ulcerative lymphangitis of horses and found in two cases the Preiss-Nocard's corynebacterium pseudo-tuberculosis which stains well by Gram's method. In two other cases a very small slender bacillus was isolated which proved Gram positive, non-liquefying. Two further cases revealed another Gram positive bacillus which liquefied gelatin and blood serum in several days; all were isolated in pure culture. Finally in five cases he demonstrated very small Gram positive diplostreptococci. The etiological importance of the

described bacteria must be considered since they were all obtained from the material under the most careful aseptic condition. In nine cases the material was obtained from abscesses prior to breaking; in three cases it was obtained from the depth of the abscesses.

Destruction of Small Animals With Strychnine Nitricum and Potassium Cyanide.

Dr. A. Klarenbeck, D. T. W., No. 16, 1920.

Strychnin if used alone in intra-thoracic injectious produces severe convulsions; whereas, the consciousness of the animal appears to be only slightly affected. Single injections of diluted hydrocyanic acid produces severe pains. These two disadvantages of the two poisons have been eliminated by the author by injecting first the strychnin and then at the moment the tetanic convulsions develop, he injects potassium cyanide. Death follows almost instantly. He uses the strychnin in a saturated solution, of which he injects 5 to 10 cc; the cyanide of potassium in a 5 per cent solution in doses of 2 to 6 cc., depending on the size of the animal.

Two Cases of Abortion of Tubercular Origin.

A. Thomsen Kopenhagen, D. T. W., No. 29, 1920.

In both of these cases the afterbirth manifested distinct pathologic-anatomical changes, although efforts at isolating the abortus bacillus were negative and other signs of the infectious form of abortion were also absent. In both cases the absence of changes which would miscroscopically suggest tuberculosis, were striking. Likewise, the miscroscopical examination failed to reveal the typical tubercular tissue changes.

At the present time it is impossible to accurately estimate the number of cases of abortions which result from tubercular infections.

Etiology of Diphtheria of Swine.

SCHMIEDHOFFER. Zeitschr. f. Infek. d. Haust, Vol. 19, p. 345.

A very virulent bacillus was isolated from the internal organs of hogs affected with diphtheroid symptoms which when inoculated into the buccal cavity of pigeons and guinea pigs, as well as into the eyes and intestines of rabbits, produced a disease identical with the diphtheroid infection of hogs. The morphological, biochemic and agglutinating characteristics of the bacillus identified it as belonging to the paratyphosus B group. The hogs from which the bacillus was isolated revealed independent primary diphtheritic changes in the mouth. The intestines and the lymph-glands failed to show any lesions of the disease.

Cows Plow in Germany.

P. M. Chappel, just returning to this country after spending the last four months of 1920 in touch with agricultural leaders in Germany and in observing conditions in every part of the empire, says:

"Agriculture in Germany is in a bad way, simply because they have no horses. Heavy losses in the war and practical discontinuance of breeding in order to save food, has destroyed the work stock almost entirely.

"Even if horses were available, few would have money to buy them. Many men, women, boys and girls are turning over the sod with spades. Others fortunate enough to have plows, hitch up whatever live stock they have, a cow and a horse, a cow and a yearling, a cow and a mule—some of the queerest combinations I have ever laid eyes on. These conditions are not local, they are general. A frequent sight is a man plowing with a cow hitched to his implement and his wife leading the cow. Harnesses of rope or anything that will hold together are used. Fortunate indeed is the man with a good yoke of oxen.

"In Berlin, 90 percent of the horses are small Russian ponies, weighing about 750 pounds. Few motors, but these little ponies for everything—trucking, delivering, even drawing coupes and carriages. Gasoline is very high. It was something like 80 cents a gallon when I was there. Leading agricultural economists in Berlin state that their census surveys indicate need for a half million mares—but they have no gold and few American dealers are willing to sell them breeding stock on long-time credits."

Thymol to Remove Estriade.

I note on page 53 of the January VETERINARY MEDICINE an inquiry for a drug to remove bots. I use crystols of thymol. I fill two No. 10 capsules and give at one dose, followed in six hours with a No. 10 capsule filled with aloin. The thymol kills the bots and they pass out in about 48 hours if the aloin is given as stated.—J. N. C., Iowa.

Success is not made by lying awake at night, but by keeping awake in the daytime.—Fantus.

Veterinary Surgery

Edited by L. A. MERILLAT, V.S.

Surgical and Accidental Shock

THE living body will stand a limited amount of bombardment without much harm but when the limitation is exceeded a state of collapse called shock ensues. Shock is the one remaining sequel of surgical and accidental traumatism that still defies the surgeon, and there is by no means an unanimity of opinion as to its exact nature despite an extensive study and research lasting many years. Volumes have been written about various theories aiming to prove or explain the phenomena. Brain exhaustion (Crile), fat embolism (Roswell Park), excessive elimination of carbon dioxid (Henderson), exhaustion of the vasomotor mechanism (Erlanger), muscle toxemia (Cannon), absorption of the plasma by the tissues (Hitchings), with others are among the theories of shock in humans, but withal, although not unchallenged, the theory of "pooling of the blood" still stands out as the most rational explanation, and certainly from both our antemortem and postmortem observations this theory explains the cause in our cases well enough.

When the brain is exhausted from injury, surgical or accidental, the body has lost the function that not only transmits the energy to the tissues but which maintains functional equilibrium. The ensuing state of relaxation causes a pooling of the blood at points of least resistance, generally the large veins of the abdominal viscera. "Splanchnic hemorrhage," found so commonly in postmortem examination of animals dead from shock, is a logical explanation of the condition. That these vessels may sometimes not be filled is admitted, but in all such cases it has been found that the subject was protected against splanchnic pooling by fullness of the viscera with aliment; and other veins, particularly those of the extremities, were found engorged. The theory of "plasma hemorrhage," that is, the absorption of the blood serum by the tissues we have had to elicit in several cases in which pooling in the large veins was not found. These were cases of long drawn-out operations attended with considerable struggling on account of imperfect anesthesia and a large blood loss.

But brain exhaustion does not explain all the cases of shock in animal surgery, for we have cases in which the brain could have sustained no damage sufficient to cause a fatal case of collapse. We know that in veterinary practice there are combinations of conditions other than brain exhaustion that may cause shock. Practitioners will remember well the days of acute indigestion in horses, when feeding and working conditions were less rationally managed. It was not unusual to find a poor brute engorged from pharynx to rectum with a seething bubbling mass of ingesta that ballooned the body to suffocation. When the stomach-tube was first brought into use it was found that no matter how badly the case was affected the engorgement could be promptly removed. The great intra-abdominal pressure would sometimes force out through the tube, gallons upon gallons of the semi-solid and gaseous contents, bringing in a very few minutes a complete relief. Sometimes, in fact very often, the animal, although apparently cured, would begin to sink into a state of collapse. The body would tremble and become cold, the pulse weak and thready, the nostrils dilated and the respirations rapid. In two hours the subject would be dead. This is shock in its plainest form and pooling of the blood without any initial brain exhaustion explains it all. The animal "bled to death" in the exhausted splanchnic vessels relieved too suddenly from the pressure that dammed the blood away during the engorgement period of the malady. Here brain exhaustion is a result and not an initial cause, for the pooling in the veins of the abdomen not only destroys vasomotor equilibrium by lowering aortic pressure but it also prevents the brain from functioning.

Cases of shock also follow evacuation of gases from the intestines with the trocar and canula, especially if evacuated too rapidly. Practitioners will remember cases of bloat, especially bloat of

long duration relieved with the trocar and canula, that were followed by this same collapsed state. Although not always fatal many of them succumbed. The autopsy always revealed pooling in the intestinal veins.

Bovines relieved too suddenly from bloat by rumenotomy or by large canulae are prone to be victims of the same condition.

Then we have the condition of collapse following replacement of an inverted uterus. After the uterus has hung out through the vulva for some hours in its heavy gravid state it is paralyzed, exhausted, its vessels are relaxed, and when reposition is made the resumption of its circulation favors pooling of large volumes of blood in its veins. The result is tremors, coldness, embarrassed circulation and often death. Again, this is shock, without brain exhaustion as an initial cause.

To these we might add the sudden evacuation of the bladder that has been enormously distended from urethral obstruction, stricture, calculi, etc. All of our cases of seriously distended bladder, whether evacuation was performed through the rectum with a trocar and canula or by catheterization after removing the obstruction, have been followed by more or less shock, some proving fatal.

And finally, does not pooling of blood in the enormous venous apparatus of the mammae following parturition explain as well as any other theory the cause of milk fever in cows? The fact that damming the blood back by air pressure cures the condition of collapse seems to substantiate the theory.—L. A. M.

Pterygium.

I am writing you in regard to an unusual case which occurred in a draft mare six years old, a very valuable animal. The owner stated that about three months ago he noticed one eye partly closed; the lids appeared slightly swollen and closer examination of the outer surface of the cornea disclosed a small growth about one-half to three-fourths of an inch square, and not more than one sixty-fourth of an inch in height.

He called a "correspondence school graduate," who ordered mild treatment twice daily, bathing in sweet milk and eye lotion; evidently nothing severe as the mare is not nervous at present when the eye is examined.

At present the lids show no inflammation; the eye opens to its full extent. Both eyes are prominent and the growth does not appear to affect the sight in the least. The growth appears to be granular, and of a very pale red color. I would be grateful for any suggestion as to treatment.—**L. E. T., Illinois.**

Reply: The querist describes a typical case of pterygium—a benign growth that is not at all uncommon in domestic animals. Pathologically it is a growth of the conjunctival mucous membrane over the sclera into the corneal zone, and although often showing a striking tendency to encroach farther and farther over the cornea and sometimes exhibiting a granular surface, malignancy need never be feared except in old animals. The terms "pterygium granulosum" and "pterygium carnosum" refer to physical rather than to pathological variations. It is safe to venture that this case is a benign growth that will yield promptly to extirpation.

After carefully anesthetizing the eye and the involved conjunctival tissue with a two percent solution of cocain or four percent novocain solution, the growth may be shaved down with a sharp scalpel, trimming from the cornea outward; or it may be trimmed down neatly with sharp curved scissors. The standard manicure scissors or Mayo dissecting scissors should be used. The bleeding should be controlled with adrenalin chloride solution, 1-1000, in which the cocain or novocain should be dissolved. It has been our practice to touch up the raw surface lightly with a pencil of silver nitrate, not so much as a therapeutic procedure as to prevent bleeding after the effect of the adrenalin has subsided. An intractable animal should be cast, although we have seldom found recumbent restraint necessary.

The after care comprises the use of simple astringent collyria.—L. A. M.

Local Treatment of Uterine Infections.

According to Vignes,* the medical profession is changing its opinion in regard to the value of uterine injections. The author states there is no justification in entering the uterus after the first week, for the reason that streptococcic infections are rebellious to such treatment yielding to nothing short of excision into sound tissue. The curet is likewise found useless because nests left behind become the starting point for new processes. Just how intimately this applies to veterinary obstetrics is best known to those who have had the largest experience with uterine infections. It is an added warning to those who by habit insist upon harmful meddling with the interior of the uterus.

[1] Gynecologie et Obstetrique, Paris, Vol. 2, No. 3, 1920.

Cattle Practice

Edited by JOHN FRANCIS DE VINE, D. V. S.
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Cystic Ovary and Cystic Degenerated Ovary

IT IS no easy task to attempt to discuss cystic ovaries as briefly as has been our aim throughout this work. In discussing the various topics considered it has been our purpose to make each subject a brief and attractive reference for the busy practitioner. This may be better understood if we note that Professor Williams in his excellent work on "Obstetrics and Diseases of Breeding Animals,"* uses 37 full pages to discuss this subject. Several of these pages include closely written small type reports of Professor Rubeli, a noted anatomist, and Prof. E. Hess on "Sterility of Cows."

One particular thing that perhaps has not been made plain enough for the practitioner—at least it was not plain to me until I began giving this work special attention—and that is the difference in seriousness of a cystic ovary and a cystic degenerated ovary. It is my opinion that the cystic ovary may be defined as one where the Graafian follicle comes to the surface and instead of rupturing, as it does in physiological ovulation, fails to rupture for some reason not yet definitely understood; apparently the tunica albuginea does not become thin, allowing ready rupture, as is the case in natural ovulation, but rather stretches, resulting in an increased accumulation of fluid and giving rise to a blister-like mass varying in size from a pea to a baseball and in some cases even greater, becoming enormous, and approximating a football. This cystic mass may be either single or multiple.†

Ordinarily this form of cysts is comparatively benign, and usually such ovaries respond readily to treatment by simply crushing the cysts and massaging the organs perhaps one, two or three times. This is the character of cysts that are so often found in young pure-bred animals and older animals that are subjected to high protein feeding, irregular breeding and injudicious confinement. When the cysts are crushed it is usually found that the ovary of a cow, which is normally about the size in length and breadth of a lima bean, but much thicker, seems to have been atrophied by the pressure of the cyst. The ovarian tissue does not give the feel of being much greater than the loose tissue that surrounds the cyst, feeling as if the ovarian tissue proper has been destroyed, but everything being approximately normal. These are usually very satisfactory cases to treat.

The tissue seems to proliferate rapidly and normal functioning of the ovary in most cases soon becomes established. Since these cases are so often associated with nymphomania, we will discuss their handling under this heading, but would like to draw the reader's attention to the probability of this form of ovarian cyst being associated with a disturbed circulation of the ovaries and being entirely in harmony with what appears to be the predominating theory among recognized gynecologists as to the phenomena of cystic ovaries in the human family.

Formerly it was believed that rupture of the follicle was brought about by the increased tension resulting from the rapid formation of the liquor folliculi, which, according to Nagel, was markedly accentuated by the pressure exerted by the luteun cells developing about its periphery. Clark, however, has shown that rupture of the follicle is a complex process and is due primarily to circulatory changes. As the period of ovulation approaches, the ovary becomes engorged with blood, and the intra-ovarian tension being markedly increased, the growing ovum is forced to the surface; at the same time the circulation in the most distended portion of the wall of the follicle is interfered with, whence results necrosis at the point designated as the stigma, which eventually gives way.

If this theory is correct it would seem to explain the simple cystic ovary and how crushing

* Williams Veterinary Obstretics. Pages 160-198.

† I recently examined the ovaries of a three-year-old barren sow. They were cystic and about the size of a grape fruit, with 13 well-defined cysts on one ovary and seven on the other. I have never seen as many as this on the ovary of any other animal.

the cyst and massaging the ovary so promptly and uniform corrects the condition by influencing the circulation.

Cystic Degeneration.

Etiology—Notwithstanding that in some cases it seems quite clear, while in others it is entirely obscure, there seems to be but little doubt that cystic degeneration of the ovaries is in most cases the outcome of previous infection.

It is stated that in the human family degeneration of the ovaries not infrequently occurs after acute attacks of infectious diseases, such as smallpox, typhoid, scarlet fever and severe intoxications, such as are caused by phosphorus, arsenic, etc. Surely those devoting special attention to sterility work in cattle must feel that by far the largest majority of the serious pathological conditions met with in the ovaries are occasioned by infection.

We are of the opinion that the custom now in vogue of handling dairy cattle, with special reference to making records, has much to do with the simpler conditions that are causing temporary sterility in our fine herds, but we question if there are many or any cases of cystic degeneration of the ovaries that are not occasioned by infection.

For our purpose we will define cystic degeneration of the ovaries, as differentiated from cystic ovaries, as a condition in which the tissue, particularly the interstitial tissue, is thicker, and the ovary is apt to be either rubberlike or doughy, with a tendency to lead into oophoritis, becoming hard and fibrous.

In the case of cystic degeneration of the ovaries most of the cysts are apt to be deep seated and if crushed one can place the end of the thumb or finger into the cavity. This cavity may be just as marked, if the ovary is examined again in two or three days, showing a lack of normal circulation and regeneration, indicating, as might be expected, a degeneration resulting from interference with the circulation.

Ordinarily these are not the types of cystic ovaries that are associated with nymphomania, but rather are associated with the cases in which there is an absence of estrum, or sexual excitement; or the estrual period is so mild as not to be noticeable even when the cow is turned into the yard with other cattle during the day. These cases are styled dumb estrum. We have seen them mingle with other animals unnoticed, but upon examination found the generative organs showing evidence of estrum, this evidence being substantiated by the cow standing for service, but her estrum being too mild to be casually observed.

This form of cystic ovaries may be associated with a cervicitis of more or less severity, or a catarrh or pyometra of the uterus. Degenerated corpus luteum is rather a common complication.

Treatment—It is our judgment that constant faithful attention to the ovaries is the remedy for these cases, frequent massaging, dislodging the corpus luteum if present, continuing manipulation of the ovaries and horns until cysts cease to form and the animal has normal estrual period. Of course, draining the uterus if it requires it and keeping the cervix clean by frequent vaginal douching are obviously essential; however, there is much satisfaction in the knowledge that the effort will usually bring results in very obstinate cases.

We recently had at our hospital a valuable pure-bred heifer about three and a half years old. There is no record of breeding, but the animal was probably aborted somewhere about the age of two years. She was first examined about a year ago, when found to be suffering with cystic degeneration of the ovaries and a mild pyometra, sufficient to cause more or less constant slight discharge. She was treated irregularly for about eight months without any apparent improvement, and then brought to our hospital, receiving daily vaginal douching and thorough massaging of the ovaries and uterus every three days. The ovaries were about the size of a large black walnut, rubberlike in texture, and pitted with deep cysts.

Under regular treatment in about six weeks the cysts ceased to form and there was no remaining evidence of pyometra. She received no further attention for about three weeks, when it was found that both ovaries were practically normal in size and texture, and that she had been in heat without giving any evidence of it, notwithstanding she had been running with a small herd.

The fact that she had been in heat was evidenced by the presence of a rather leep-seated corpus luteum found in the right ovary. This was pressed out and the animal showed normal estrum and took service the ninth day following.

He that borrows the aid of an equal understanding doubles his own; he that uses that of a superior elevates his own to the stature that he contemplates.—Burke.

Swine Practice

Edited by A. T. KINSLEY, M.S., D.V.S.

Porcine Abortion Still Prevails

RECENT reports of the occurrence of abortion in swine are rather numerous and we are disappointed that the investigations that are being conducted at various experiment stations have not yet been completed and, therefore, the final word relative to porcine abortion must be withheld.

The condition or disease is not confined to any particular section of the country, neither is it confined to any one particular breed of swine. Some reports would indicate that the abortion in some herds occurs early in the period of gestation and the aborting sows in these herds evidence a vaginal discharge of a mucopurulent character. Such sows do not conceive or at least not until the discharge ceases. Because of the small dimension of the uterus and the length of the vagina, these cases are difficult to treat. Some practitioners claim to have obtained good results by irrigation of the vagina and when possible the uterus with a physiologic salt solution. The douches are given every second or third day and continued until there is no evidence of discharge. Other practitioners are using a herd bacterin prepared from cultures of microorganisms isolated from the vaginal discharge. Some reports appear to indicate that the bacterin treatment is of value, although an occasional sow in an infected herd may not respond to the bacterin treatment.

Some commercial houses are advertising an anti-abortion bacterin for swine. This bacterin, we understand, contains the B. abortus (swine), an organism microscopically and culturally identical to the B. abortus Bang of bovine origin. If abortion in swine is caused by the B. abortus (swine), then the bacterin may be of value but this has not been definitely demonstrated. It is true that abortion in swine may be produced experimentally by the B. abortus Bang of bovine origin, but that is not conclusive evidence that all abortion in swine is due to the same cause.

The Iowa Experiment Station has reported some experiments in the feeding of mineral or inorganic salts to sows that are interesting and may indirectly have some bearing on abortion in swine. According to their experiments it appears that the feeding of a combination of inorganic salts to sows has resulted in the production of larger litters and better pigs. It is possible that insufficient mineral ingredients in the foods have predisposed sows to a variety of infections which under the predisposing influence resulted in abortion.

The only recommendation that can be made at this time in the control of abortion in swine is to institute sanitary regulations and to isolate aborting sows and prohibit rebreeding until all discharges from the genital organs have ceased. It also seems advisable to recommend the use of certain inorganic salts to be given in a self-feeder for aborting sows for some time prior to breeding and during the period of pregnancy.

Causative Agent of Abortion in Sows Not Yet Identified.

I am writing you for information concerning some pure bred Chester White sows that are losing their pigs from five days to three weeks before the normal birth period. Of the pigs that are carried until within five days, about one-half are born alive, but are weak and soon die.

These sows were allowed in the stalk field after the corn had been shucked, and they ate considerable corn of inferior quality. In December they were allowed to eat a horse carcass. The last week or ten days they have been getting one-half pound of tankage a day and slop.

Five of these sows have lost their pigs, and there are about that many more due within ten to fifteen days, also ten head of gilts due in March. The sows seem to be in good health and good flesh.

What do you think is the cause and what treatment would you advise?—R. E. J., Illinois.

Reply: Abortion, to some extent, has been observed at different times in isolated herds, in

which the causative agent was apparently the food, and in which the abortions were controlled by giving the proper diet. More recently we have found considerable abortion in swine that is apparently due to microbian agents. The specific cause of infectious abortion in swine has not yet been identified.

In some cases the B. abortus, which is identical in all ordinary tests to the organism causing abortion in cattle, has been isolated from the discharges and fetal membranes of aborting sows. In other instances we have not been able to identify any specific organism, but a variety of specific organisms have been found which may have been contaminating or secondary invaders.

I would suggest that in the feeding of the sows that the tankage be withheld and that the sows be given chopped feed or ground oats or barley, giving rather a light diet. Some practitioners have used the abortion bacterin prepared for the control of abortion in cattle for swine, and have claimed good results. They usually use about one-half the quantity for swine that is used in the treatment of cattle. Aside from this, at the present time, we have nothing to suggest, excepting of course that sanitary regulations should be observed, and whenever a sow aborts, she should be isolated and maintained separately from the general herd so long as there is any discharge.—A. T. K.

Feeding Pigs.

The following points are a few that should be considered essential in feeding pigs a proper, as well as an economical ration.

The pig's ration under most conditions in Illinois should be based upon corn. The cheapest protein supplements for corn usually are milk, tankage and pasture. Wheat middlings can be used in addition to the above feeds for sows' suckling pigs to induce milk production and for young pigs for good growth.

Barley is about ninety percent as valuable as corn, pound for pound, or three-fourths as valuable per bushel. Oats can be fed profitably to hogs in limited quantities when less than one-half as valuable as corn per bushel. Neither feed is as palatable to hogs as corn nor will they produce as rapid gains as corn.

The commercial mixed feeds on the market are usually too high in price to feed at a profit.

Pasture crops should be used whenever possible. They do not save as much grain as some people thought, but they are a great factor for developing the body framework, increasing vigor and preventing disease. In a general way, it may be said that pasture is usually about as valuable in saving grain as the crop would be worth for hay. Our best pasture crops are alfalfa, clover and rape.

The amount of grain to feed pigs on pasture may vary with the price of food and the time one desires to sell his hogs. When feed is high in the summer, as it was last year, and with hogs as low in price as they were this fall, it would not have paid to feed a heavy grain ration during the summer. When feed varies but little in price from summer to fall and winter, one can usually afford to feed a heavy grain ration in the summer to hit the higher market of the early fall. A medium to a full-grain ration is usually more profitable than a lighter ration for the pig on pasture.—J. B. RICE, Associate in Animal Husbandry, University of Illinois, Urbana, Ill.

Subcutaneous Abscesses in Swine.

I would like to obtain information from experienced practitioners, through the columns of VETERINARY MEDICINE, on the following points:

. Has the intramuscular administration of immune hog cholera serum any advantage over the subcutaneous method in avoiding abscesses, providing similar aseptic precautions are taken and not more than 15 to 20 mils being injected into an area?

Does muscular tissue absorb the serum any more rapidly than the subcutaneous connective tissue?

We were taught the latter method at school.—L. A. S., Minnesota.

Reply: The intramuscular injection of anti-hog cholera serum has the advantage over the subcutaneous method because the absorption is much more rapid when introduced into the muscular tissue than when introduced into the subcutaneous connective tissue. This statement particularly holds good in swine because of the subcutaneous layer of fat and, according to investigations of some, small quantities of serum or virus injected subcutaneously may not be absorbed for an indefinite period of time.

Abscess formation, so-called, succeeding the injection of anti-hog cholera serum, is not, as a rule, typical of the usual abscess. The lesions are the result of infection in the disintegrated red blood cells and fibrin which constitute a portion of the anti-hog cholera serum. Clear serum contains none of these foreign substances and consequently abscess formation after the use of clear serum is exceptional.—A. T. K.

Live Stock Poisoning

Edited by L. H. PAMMEL, Ph. D.

Professor of Botany, Iowa State College, Ames, Ia.

Equisetosis or Horsetail Poisoning

DR. L. L. PARKER of Catskill, N. Y., sends some specimens and a description of a case of poisoning from horsetail or "foxtail" as it is called in New York. He writes:

"I am taking advantage of the offer of VETERINARY MEDICINE and am forwarding you specimens of a plant known in our locality as foxtail. Kindly advise the name of this plant and also whether it is poisonous.

"Early in September last I examined a pair of horses which seemed normal with the exception that they sustained their equilibrium with difficulty. They staggered in walking straight away and would nearly fall when turned. The horses had been fed hay which contained a great quantity of the plant, the sample of which I am sending. I believe that one-fourth part of the total amount of hay consisted of the plant.

"After a thorough catharsis, the horses rapidly recovered and within a few days were normal. Orders were left not to feed any more of this hay.

"About the middle of January I was called to the same place again and found one of the pair previously affected showing the same symptoms as before, only in a more pronounced manner. It is with difficulty that he keeps his balance moving straight away and braces himself when standing idle. I have given him a thorough cathartic and stimulants, but he does not improve rapidly. The caretaker informs me that only clean hay had been given until December when the same hay as first given was used.

"I wish to thank you and VETERINARY MEDICINE for making it possible for the veterinarian to solve these puzzling questions. You are doing a great service."

Reply: This poisoning is undoubtedly caused by horsetail. The symptoms as described in my "manual of poisonous plants" are as follows: The first evidence of the trouble is more or less unthriftiness, the horse appearing thin and the muscles wasted. In from two to five weeks, according to the age of the horse and the manner of feeding, the animal begins to lose control of its muscles, sways and staggers like a drunken man, although its eye looks bright, it eats well, and may even try to caper and play. After muscular symptoms become pronounced many cases refuse to lie down, standing until thrown down by disorderly muscular contractions. If it continues to eat the plant the horse in any case soon loses power to stand and goes down, after which it becomes very nervous and struggles violently to get up; the legs become more or less rigid, and at times all the muscles of the body seem convulsed. Even in this condition one well-nursed patient lived two weeks. The horses are generally willing to eat, although unable to rise, but becomes sore and tired, turning from side to side three or four times in twenty-four hours, thus preventing gravitation congestion of the lungs and kidneys. The low pulse becomes slow until toward the end, when it is rapid and weak. The temperature is below normal until the animal goes down, after which some fever develops in consequence of the nervous excitement and violent struggling. The extremities are usually cold, and in the winter horses suffering from equisetum poisoning suffer severely from the cold, presumably because of diminished oxidation and consequent low body temperature. The visible lining membranes of mouth, nose, eye, etc., become pale.—L. H. P.

> Readers are urged to take advantage of the opportunity offered by Dr. Pammel, for the identification of specimens of supposedly poisonous plants. Two good-sized specimens, carefully packed, should be sent to him direct, with such history as may be available. Simply mention that you are a reader of VETERINARY MEDICINE and no charge will be made for this service.

Spoiled Cottonseed Meal.

Dr. F. Y. S. Moore of McAlester, Okla., sends some samples of cottonseed meal with the following communication:

"I am sending you today by express four sam-

ples of cottonseed meal for examination for molds. Sample No. 1 is from a sack that was all lumpy and discolored. The owner, J. W. Lewsaw, was feeding a bunch of cattle, and although they all seemed healthy, except one, on a Friday evening; he found five cows and a bull dead on Saturday morning. The autopsy did not show anything except reddening of the lining of the abdomen, and some enteritis. Everything else was apparently normal. Brain and spinal cord were not examined. He was feeding cottonseed meal and hulls.

"The other three samples were brought to me to send away for examination. The owners, who are feeding several hundred head for market, say that the cattle do all right for two or three days, and then they seem to get some bad feed, and scour awhile and lose all the gain.

"C. H. Allen, who is feeding the biggest bunch, claims that they have ground up the cottonseed cake which has been accumulating at the oil mill for several years, and are mixing it in with the meal.

"The cow in the first bunch that I mentioned as not being well has not been doing good for some time, and was noticed to be scouring the day before.

"The cattle that are getting feed like that given in samples No. 2, 3, and 4 are in pens close to the mill. They get nothing but hulls and meal, which is mixed in the wagons at the mill and hauled right out to the feed pens. They get city water. I am a subscriber to VETERINARY MEDICINE, but do not know whether this kind of an examination is included in the free service or not."

Reply: The material sent in was reported upon as follows: No. 1 is rancid and moldy. No. 4 is also bad, has a bad odor, and is dirty and stale with molds and bacteria. Of course it should not be fed. The trouble no doubt is attributable to poisons produced by the organisms.

The material sent, especially samples No. 1 and 4, contain molds and bacteria, which undoubtedly has rendered them unfit for use as food for animals. No. 1 was rancid, indicating the multiplication of bacteria and molds. The samples when studied under the microscope showed the presence of organisms of various kinds. These molds and bacteria, no doubt, excrete toxins which are injurious.—L. H. P.

Silage Poisoning.

Mr. Percy Forsythe of Griswold, Iowa, sent me the following communication: "I am sending you a sample of my ensilage to be analyzed to see if it contains poison in any form that would affect cows in any way. Two of our cows have lost their calves about a month before calving time, one cow died and the other is in bad shape. The attending veterinarian thinks that the ensilage is not the cause of the trouble but on account of several moldy spots in it we are afraid that it may be. Part of the ensilage appears all right but it contains some moldy cakes from six inches to a foot in diameter and from four to five inches thick. We have tried to keep the cows from getting these cakes, but probably they do get some. We thought perhaps the cause of the mold was from the ensilage being too dry when it was put in to the silo. I am sending as many kinds of mold as I could find. Will you please analyze this and let us know at your earliest convenience, as we are waiting to feed this ensilage again."

The silage has been examined and found to contain many molds, some of which I have been unable to definitely classify. However, I find present in the silage some Fusarium, considerable Monascus, which gives to the silage in certain places a pinkish color. An undetermined mold, one of the *Pleosporaceae* (of a blackish color) is especially common on the sheaths, also an abundance of bacteria.

The moldiness is caused by the air getting into the silage. The silage contains an enormous amount of bacteria. These types of mold indicated above are not safe to feed to live stock of any kind. I have no doubt that the cow's death was caused by this moldy silage. Whether the silage was the cause of the loss of the calves is difficult to say. In using the silage, all moldy silage should be removed. There is nothing else so far as I know, about the silage which would be injurious to live stock. Of course, there may be other injurious qualities in the silage which I have not recognized.

Feeding Decayed Sweet Potatoes.

Dr. W. S. Rader of Broken Bow, Okla., sends the following communication in regard to the feeding of decayed sweet potatoes and refuse material from a sorghum cane mill. "Being a reader of your articles on live stock poisoning in VETERINARY MEDICINE I desire your opinion of what ill effect, if any, would result from feeding decayed sweet potatoes to dairy cattle. The potatoes were dumped from a nearby curing house into the field in which these cattle were being winter pastured. The field is one of forty-four acres, part of which is woods pasture and

the tillable land is farmed to corn, cotton and cane. A large creek runs through this field. In this field was a large pile of crushed cane the residue of sorghum and syrup making. The owner of the cattle lost two cows and a bull, all of which showed the same symptoms, according to his statement. I did not see either of the cows but was called to see the young Jersey bull. The bull showed the following symptoms:

"At 6 p. m. Tuesday evening his temperature was 103.2°, pulse rather fast, but soft; the breathing was in the nature of a pant, as though he had run hard on a hot day. He would cease panting now and then and emit short painful grunts and groans. very much like those accompanying impaction of the rumen. The rumen was not packed nor distended with food, a fact ascertained by palpitation of the rumen, although there was a small amount of gas present which was belched up rather frequently.

"The bowels moved rather frequently, a small amount of excrement of a semi-liquid consistency and of a chocolate brown color being passed. The bull's temperature Wednesday at 10 a. m. was 102.2°, the pulse a little firmer to the touch. The owner said the two cows showed the same symptoms, only in a more aggravated form. The first cow lived about two days, the second cow took sick while being milked about 7 a. m. and lived about thirteen hours. I prescribed for this cow. The following morning the owner burned the pile of cane refuse. The bull did not take sick until four or five days later. These cows had recently freshed and were in heavy milk and were being fed bran, cotton-seed meal and cotton-seed hulls. The owner says he had been feeding about four pounds of meal and ten pounds of hulls twice daily and they had to get other roughage from the field."

Reply: It is difficult to say, from the symptoms, just what may have been the trouble with the animals. It is not advisable to feed decayed material of any kind to animals. Decayed sweet potatoes are bound to contain a large number of bacterial organisms. It would be difficult at this time to say whether the bacteria found in the sweet potatoes contained such organisms as *bacillus botulinus*, to which many cases of forage poisoning have been attributed. In many of the cases of poisoning from canned olives and other canned goods this organism has been found. This organism produces a powerful poison. The investigations of Dr. Graham of the University of Illinois prove beyond doubt that this organism (and others like it) does produce fatal poisoning. Refuse from the cane mill, when left out of doors subjected to dust and other contamination, may act injuriously. However, sorghum cane when fresh or as ensilage is considered good forage.

Some Forms of Lima Beans Poisonous.

A South Carolina newspaper publishes the following note concerning what are termed "butter beans":

"Several days ago *The Ledger* reported the fact that L. W. Jolly of Piedmont, in Spartanburg county, recently lost one cow and poisoned two others by feeding the animals butter bean vines. This item caused considerable comment, as many people thought there must have been some other cause for the illness of the cows. Several asked County Farm Demonstration Agent S. C. Stribling about the matter, and in order to secure reliable information Mr. Stribling wrote to the state veterinarian at Clemson College. In reply, R. O. Feely, the state veterinarian, stated that lima beans contain a great deal of hydrocyanic acid, and of course, when cattle eat a quantity of these beans they will be poisoned. Some fields of lima beans contain more than others."

Let it be clearly understood that the term "butter bean" means something entirely different from the lima bean. In the North the term butter bean is commonly applied to the haricot and golden wax beans (*Phaseolus vulgaris*), This bean is not poisonous. Dr. R. O. Feeley correctly states that lima beans, at least some varieties, do contain hydrocyanic acid and therefore, are poisonous. I had a somewhat lengthy article on the subject in this journal a few years ago.—L. H. P.

Animal Poisons.

Flury. in a lecture on animal poisons, calls attention to similar poisons in animals and plants.* Mention is made of the basic histamin tyramin, adrenalin protamine. These are poisons of the digitalis group. Of the sapotoxin group, kantharidin is well known. A poison resembling anemon also occurs in animals. Various amphibians produce poisons with action similar to digitalis. The ancient Kalahari used as an arrow poison was obtained from the larvae of one of the beetles (*Diamphidia locustris*). The poison from the honeybee, according to the author, contains one of the sapotoxin-like substances.

* Berlin Klinsche Wochenscher, 56: 906, 1919, Pharmaceutische Centralhalle.

Laboratory Diagnosis

Edited by C. A. ZELL, D. V. M.

Lymphadenitis or Nodular Disease in Sheep

I AM sending you an intestinal section taken from a sixteen-month-old sheep. We have lost six from this herd in the past ten days. They all seem to be from the last year's crop of lambs that are now lambing. We notice scarcely any symptoms until the sheep goes down. They walk a short distance after being helped on their feet; temperature is normal; respiration about normal; appetite poor after going down.

On postmortem examination we find all organs normal. We find throughout the intestinal tract the small nodules that you will note in the specimen. They seem to contain a hard, cheesy pus. We have five or six sheep in the herd now affected the same way. Some of the sheep before dying give birth to the lamb but all are dead.

Please examine for nodular disease, and, if positive, advise me of the treatment.—J. R. H., Kentucky.

Reply: A careful examination of the specimen showed it to contain very typical nodules characteristics of lymphadenitis, or what is commonly known as nodular disease in sheep. A bacteriological examination confirmed the findings of the pathological examination.—C. A. Z.

Comment: As to treatment, E. T. Baker in his book on "Sheep Diseases" says: "There is no known satisfactory medicinal treatment for nodular worms in sheep."

However, we would suggest that you experiment by administering sodium cacodylate in 20 to 30-grain doses, dissolved in one-half ounce of sterile water and administered slowly, intravenously. This should be repeated at about five-day intervals for three to six doses. It might be efficacious if administered subcutaneously. In addition to this and at the same time you should administer anthelmintics to free the intestines of the mature oesophagostomum columbianum, the larvae of which very likely is the innoculating media which carries the Bacillus pseudotuberculosis ovis (bacillus of Preisz and Norcard) into the tissues and between the two causes the nodules. You should also, as far as possible, isolate the affected from the non-affected sheep.

Prevention, of course, is the *sine qua non*, and as to this Dalrymple says he has found that he can practically prevent the infection of lambs with this parasite by raising them in bare lots, that is, keeping them with the ewes in yards which are kept clear of all vegetation. Cut green feed and other fodder is fed in raised racks, and water is furnished in troughs also raised from the ground and protected from fecal contamination. The floor of the yard is kept as free as possible from litter and manure by frequent cleaning.

General preventive measures consist in avoiding wet low lying pastures, changing animals to fresh ground as often as possible, supplying them with clean water, plenty of nourishing food, and a liberal allowance of salt. Animals known to be affected should be isolated from the rest of the flock.—E. L. Q.

Directions for Packing Specimens for Laboratory Examination

1. Gross anatomical lesions, where a bacteriologic examination is desired, are best sent packed in an ample quantity of borax. A corrugated paper or wooden box is preferable to an air-tight container (can). As second choice, such specimens may be carefully wrapped in cloth, wet in a 10 percent formalin solution, properly boxed.

2. Specimens of tumors or other tissue, not for bacteriological examination, may be sent in a 4 percent formalin solution.

3. Specimens of blood, pus and body fluids for bacteriological examination or for serum tests should be drawn aseptically and sent in sterile containers (small bottles boiled and cooled), air-tight. Such specimens should reach the laboratory quickly. If sent by parcel post, should be sent special delivery. It is best to send blood, pus and body fluids by first class mail, special delivery. If the quantity of pus is small, dilute with sterile normal salt solution to prevent drying. Sterile containers supplied free on request.

Chemical analyses cannot be furnished free of charge, owing to the vast amount of work involved.

Send all correspondence and specimens to Veterinary Medicine, 53 W. Jackson Blvd., Chicago, Ill.

Hemorrhagic Septicemia in Chickens.

I am sending you a hen for postmortem examination or a bacteriological examination or any-

thing to come to a conclusion as to what the diagnosis is. What is the matter with her and what treatment would you recommend? The owner has several hundred chickens and loses an average of two or three each week, all showing the same symptons. They are unable to stand, do not eat or drink, and may live a day or a week after getting sick, always wanting to keep their head up and backwards. I am sending you this one alive so you may note the symptoms.—G. M. P., Ohio.

Reply: The chicken sent for postmortem examination was received some time ago. Since the symptom commonly called limberneck was so apparent, I kept the chicken alive for some time, but finally decided to kill it as the condition became steadily worse.

The postmortem examination revealed some very interesting facts. The brain and meninges, especially, showed a marked congestion, with several hemorrhages throughout the cerebral cavities. A bacteriological examination showed the bipolar organisms of bacillus avisepticus and streptococci. This is quite an unusual case of hemorrhagic septicemia, confined mostly to the central nervous system. The other organs were practically normal, except for a very few small petechia in the epicardium.

It is our belief that an autogenous bacterin made for this flock of chickens will help greatly to control the disease.—C. A. Z.

Anthrax in Cattle Resembling Hemorrhagic Septicemia.

We are sending you a tube of culture media containing pure culture of bacteria taken from an animal (heifer) dead about four hours. This culture was made in a laboratory operated by a physician, an experienced bacteriologist. They say this organism resembles anthrax in a number of ways but is not anthrax.

The postmortem lesions consisted of petechial hemorrhages of the heart and kidneys, marked swelling and hemorrhage of the mesenteric lymph gland, hemorrhagic blotch in the gall bladder, bloody discharge from the anus, and much hemorrhage on surface of the spleen, but not much enlargement. Almost the entire length of the small intestines showed numerous parasitic nodules and contained nothing but mucopurulent like material. Microscopic examination of this material showed pus cells principally.

All cattle affected with this disease die suddenly. The owner of this herd has lost about 15 head in this manner since last September or thereabouts. The disease was first thought to be hemorrhagic septicemia and the herd got about four treatments of mixed infection bacterins, which seemed to hold for about one month, before other deaths followed. Adult cattle seem to be affected principally. One death occurred last week and two so far this week. Sometime ago a microscopic examination of a smear from the lungs showed bipolar organisms.

Please examine this culture and let us know what it is and if possible suggest how we might prevent further losses.—H. L. F., Mississippi.

Reply: The culture sent in for examination showed typical anthrax bacilli, and this was further proven by animal inoculation. The specimen produced typical anthrax in white mice. Prevent further losses by vaccination and sanitation.—C. A. Z.

Decomposition Precludes Diagnosis.

I am mailing you specimens of liver, mesentery and lymphatic glands of hogs slaughtered this morning. I would also have sent lung and intestine specimen, but these were too badly mutilated. The postmortem lesions are: General external appearance, normal and healthy; lungs, badly diffused with blood; heart and covering, apparently normal; kidneys enlarged and hemorrhagic; intestines literally covered with pus nodules, ranging in size from a pin head to a pea; the muscles appeared bruised all through. I have followed your advice in VETERINARY MEDICINE with interest and will act upon your decision in this case. At present I have the rest of the herd under quarantine.—W. S. D., Indiana.

Reply: The specimens of liver, mesentery and lymphatic glands of a hog were received some time ago in a somewhat decomposed condition.

The bacteriological examination, as far as it was possible to conduct one, revealed no bipolar organisms, but streptococci and bacilli of the colon group (of intestinal origin) besides a goodly number of contamination organisms.

Since the specimens were not in good condition when received, it was impossible to arrive at a definite conclusion as to the exact cause of the trouble.—C. A. Z.

Giant Cell Sarcoma in Calf.

I am mailing you a piece of a fibro-fatty tumor found on autopsy of a shorthorn bull calf about ten weeks old, weighing about 175 pounds, and in good condition.

The external appearance showed enlargement of the withers, with tumor-like formation on the

right side; enlargement of right-hip region, and scrotum enlarged many times.

The postmortem findings indicated normal viscera, with increased amount of kidney and abdominal fat. Fat and right kidney (hypertrophied) filled the greater part of the right side of the abdominal cavity. On incising the scrotum the testicles were found about normal in size, but imbedded in a large amount of fatty-like tissue. The body and visceral lymph glands appeared normal. The thymus gland was abnormal in appearance, being soft and squashy to the touch. There was scoliosis of the thoracic spine.

On cutting into the enlargement of the withers a layer of fatty tissue was found, then muscle, and underneath this again the fatty like tissue down to the ribs and vertebra, covering an area from first rib and vertebra half way down the side, back to the tenth rib. The same kind of tissue was found on cutting into the enlarged right hip region.

I trust that you will receive the specimen in good condition and will be able to give me a diagnosis.—R. B. P. W., Minnesota.

Reply: The specimen of tumor of calf sent us was put through the usual sectional process. Under microscopic examination it proved to be a giant cell sarcoma, one of the most malignant tumor formations.—C. A. Z.

Contagious Abortion Suspected.

I am sending sample of cow's blood. I suspect contagious abortion.—W. E. H., Indiana.

Reply: The sample of cow's blood from an animal suspected of having contagious abortion was duly received and we applied the compliment fixation test to same. The findings were negative. This, however, does not prove that you have no contagious abortion in this particular herd. This means only that the blood of this particular animal does not contain the antibodies of the disease.—C. A. Z.

Nervous Distemper in Dog Supposed to Have Been Poisoned.

I am sending you material taken from a dog's stomach of which I would like a report. The dog was thought to have been poisoned with ground glass by a neighbor and was brought to me to be chloroformed. The subject was a small young Airedale. The symptoms were unconsciousness, groaning, eyes closed, and jerking movements at times.

The postmortem examination showed no hemorrhagic petechiae in the stomach or intestines, but the intestines contained a yellowish fluid, void of feces. The stomach contained the material sent to you. There was a slight congestion of the lungs, but all other organs appeared normal. I have eliminated arsenic poisoning, and there was no symptoms of strychnin poisoning.

Would be pleased to find out the result of your laboratory diagnosis and what the trouble was.—E. W. W., California.

Reply: The specimen of the contents of a dog's stomach was examined for the presence of poison, but no sign could be detected. We are of the opinion from your history of the case that the dog was suffering from the nervous form of distemper, and being a young dog showed jerking movements and congestion of the lungs.—C. A. Z.

Rabies in Dog.

I am sending a dog's head. This dog showed some symptoms of rabies, such as paralysis, difficulty in swallowing, peculiar expression of the eye, tendency to bite members of the family, and nervousness. Please examine the brain for rabies and let me know the result.—W. S. R., Oklahoma.

Reply: The dog's head arrived at the laboratory in a somewhat decomposed condition, due to the time it took the specimen to reach here. It was some eight days on the way.

A microscopic examination failed to reveal any negri bodies present in the specimen, and the diagnosis was therefore negative. However, we were not able to inoculate an animal on account of the decomposed condition in which the head was received. We should have liked to make a more thorough examination of this specimen, but as stated above, it was impossible.—C. A. Z.

Hemorrhagic Septicemia in Sheep.

I am sending specimens of heart, lung, liver and spleen, and also blood from the heart of a sheep.

I have been called to four bands of ewes, which are due to begin lambing in about one week. These sheep act about the same, but on postmortem examination vary considerably.

The symptoms are loss of appetite, muscular tremors, especially of head and neck; head carried high and to one side; constipation, and later diarrhea. The temperature was 102 to 104 degress. The animal goes down after three to six days, death following in about 24 to 48 hours.

Autopsy revealed bowels normal; peritoneum

shows hemorrhagic areas size of pin head to ten-cent piece. Some of the livers show hemorrhagic areas, but others do not; small hemorrhagic areas in all spleens except one or two; hemorrhagic areas in lungs varying in size from ten-cent piece to practically whole lung surface. Some show hemorrhagic areas under the skin, even though the animal had not been down. One or two showed inflammation of the walls of the bladder.

Am I dealing with hemorrhagic septicemia or pre-parturient paralysis, a condition seen just previous to lambing. I forgot to mention that I found twins or triplets in all the ewes posted, numbering nine head in all.—H. E. McM., Idaho.

Reply: The specimens showed that they all contained practically a uniform number of bipolar organisms of hemorrhagic septicemia (bacillus ovisepticus). This would prove your diagnosis of hemorrhagic septicemia to be correct.

For the remainder of the herd we strongly recommend the use of immunization treatment with the ovine hemorrhagic septicemia bacterin.—C. A. Z.

Pus Infection in Genital Organs of Bull.

I am sending some semen from a bull, which please test for spermatozoa. He seems to be sterile.—G. O. S., Indiana.

Reply: The specimen of semen from a bull which you sent us recently was received in a somewhat contaminated condition. An examination of it showed it to contain quite a number of spermatozoa, but they were inactive when received. I am unable to judge whether or not this condition was due to contamination while in transit, or whether they were inactive at the time the specimen was collected.

There was quite a considerable amount of blood present in this specimen, and other organisms found in the specimen were streptococci, staphylococci and diplococci, which indicates a pus infection somewhere in the region of the genital organs.

I am inclined to believe that careful antiseptic treatment in connection with the application of an autogenous bacterin would clean up this condition and revive the bull's usefulness in the herd.—C. A. Z.

Bloody Milk.

I am sending a sample of bloody milk from a cow with mastitis, which I wish to have examined to determine, if possible, the kind of infection present. This is the second case of this nature I have had within a month in the same stable, so I am quite anxious about it.—C. F. B., Pennsylvania.

Reply: An examination of the milk sent by you showed it to be practically all blood. It contained a number of contaminating organisms, but of the pathogenic type, only the streptococci was present. The large amount of blood contained in the milk seems to be due to a traumatic rather than a bacterial cause.—C. A. Z.

Rare Form of Hemorrhagic Septicemia in Heifer.

I am sending a specimen of muscle taken from the round of a heifer that was slaughtered and thoroughly bled. Upon cross-section of muscle small hemorrhages were found. The animal was considered to be in good health before slaughtering.

I would like to know your opinion as to whether this is a diseased condition or not.—E. A. D., South Dakota.

Reply: The specimen of muscle of heifer was found to contain bipolar organisms. This specimen was very interesting on account of the scarcity of these cases. It showed disseminated multiple hemorrhagic petechia throughout the muscle tissue, due to hemorrhagic septicemia.—C. A. Z.

Fistula in Cow.

We are mailing you a specimen of pus taken from a cow of tubercular appearance, but which did not react to any of the several tests. This pus comes from the region of the shoulder and is probably nothing but a fistulous discharge, the cow having been injured at the point of the shoulder about a year ago.

Will you kindly make examination of this pus for tubercle bacillus and report findings to us.—K. and S., Texas.

Reply: The specimen of pus did not contain any tubercular bacilli organisms, but quite a number of staphylococci and streptococci, and also a few saprophytes. We could find no signs of a tuberculosis infection in this specimen.—C. A. Z.

Nodular Disease in Sheep.

Am sending a section of small intestines of sheep, and wish you would tell me just what the nodules are. I have always claimed them to be parasitic, but would like to have your opinion.—D. J. C., Iowa.

Reply: See reply to J. R. H., Kentucky, first article, this department.

Parasitology

Edited by MAURICE C. HALL, Ph.D., D.V.M.

Parasitic Worms and Bacterial Invasion

WORK which has been done in the course of the last few years has not only strengthened the belief that parasitic worms do considerable damage, but has indicated that they are guilty of doing more kinds of damage than the conservative parasitologist suspected ten years ago or the more radical believer in their injuriousness could prove at that time. Some of the more interesting developments are reviewed here for the benefit of the veterinarian who in all good faith is inclined to question the importance of parasites and to deny that they do any especial damage.

One can readily see why a veterinarian who makes postmortem examinations of numbers of horses dying from all sorts of causes, and finds large numbers of worms in all of them, begins to discount worms as disease factors and ends by concluding that since all horses, sick or sound, have them, they must be of no importance. But it would perhaps be more accurate to conclude that his standards for comparison were inadequate, and that since he never saw a horse without worms, he never saw a really sound or normal horse. Certainly the "serviceably sound" horse may be a clinical case of strongyloidosis; it may have, and usually does have, a verminous aneurism; and an experienced parasitologist can usually collect hundreds or thousands of worm parasites, representing from a dozen to dozens of species, from a postmortem examination of a serviceably sound horse. But is such a horse really a normal animal? Not if lesions are pathological. Aneurisms, petechiae, ulcers, cysts, nodules, and various grades of congestion, inflammation and degeneration are not normal, and usually all of these conditions, or nearly all of them, are present in the "serviceably sound" horse in connection with its worm parasites. But there are other features of worm infestation which have been demonstrated of late years, and it is with these things, things not usually associated with worm parasites, and in some cases still difficult to demonstrate, that this paper deals.

One of the most interesting observations in connection with worm infestations which has been published of late years is reported by Graybill and Smith in their study of blackhead of turkeys. They found that when feces containing infective blackhead material were fed to turkeys in connection with the feeding of embryonated eggs of the small heterakid, *Heterakis papillosa* (a neomatode worm commonly present in the ceca of chickens, turkeys and various other birds), the turkeys so treated became infected with blackhead; whereas turkeys fed with feces containing infective blackhead material, but not with worm eggs, did not develop blackhead. Assuming that no other factors were left unaccounted for, the natural conclusion is that the worms acted in some way, such as inoculating agents or as factors in lowering the bird's resistance, to cause the development of blackhead from material which would not prove infective for the birds in the absence of these worms.

Close Relationship Between Worm Parasites and Bacterial Invasion.

Naturally, this work must be carried further and should be investigated by other workers under other surroundings before too much may be inferred or concluded; but it is extremely interesting and suggestive, and should lead to further study along the line of establishing a close relationship between the worm parasites and the pathogenic micro-organisms. We know the resistance which intact tissues offer to bacteria, and we are just beginning to realize something of the extent to which worms, especially in their larval stages, invade and destroy the integrity of tissues—a point discussed later in this paper. In view of these facts, it would almost appear as though the burden of proof in this matter would ultimately rest on those who believe that tissue destruction by worms in the presence of micro-organisms does not lead to infection, rather than on those who are of the opinion that it does lead to infection.

In addition to the work of Graybill and Smith in regard to disease developing from infective

material in the digestive tract in the presence of worms, there has appeared a paper by de Blieck and Baudet, who have been working in Holland on worm parasites of the horse. Investigations there have brought to light a new worm parasite, *Strongyloides westeri*, one of the nematodes. This worm is capable of infecting horses when infective larval worms are placed on the skin, as the Dutch investigators have shown experimentally. De Blieck and Baudet recently carried out experiments in which various pathogenic bacteria were placed on the skin of rabbits, guinea pigs and mice, and infective larvae of *Strongyloides westeri* then placed on the same area, the skin being thoroughly disinfected after an interval to prevent infection by mouth. These experiments have resulted in the infection of the experiment animals with the bacteria used, the bacteria being subsequently recovered from these animals, the postmortem examination showing the characteristic lesions produced by these bacteria. This finding supplements the finding of Graybill and Smith by indicating that man and his animals may be infected by pathogenic bacteria or other infective agents as a result of the dissolution of continuity of tissue externally, as well as internally, by parasitic worms in the presence of these infective agents.

This immediately raises the question as to whether this danger, from a combination of worms and germs, is a common and widespread danger or a rare and exceptional occurrence. So long as civilized man lives under hygienic surroundings which make the occurrence of parasitic worms in man an exceptional affair, the danger from the worm-and-germ combination is apparently small. So far as man under unhygienic surroundings and with parasitic worms commonly present is concerned, and so far as his animals under prevailing range, pasture, yard and kennel conditions, with parasitic worms almost always present, are concerned, the danger from worm-and-germ combination may be suspected of being considerable in the light of present knowledge, with the possibility that future work may prove it to be very great. It is generally known that such bacteria as those causing tuberculosis, pneumonia and pyogenic infections are very common and widely distributed. It is not generally known how common are those worms which penetrate tissues, this being another phase of parasitology about which much has been learned in recent years.

It has been known for a number of years, as a result of the work by Looss and others, that hookworm larvae penetrated the skin, entered the lymphatic spaces, reached the blood stream, were carried to the lungs, left the blood current for the air spaces, ascended the bronchi and trachea, and were swallowed, developing then to adults in the intestine. The discovery of this life history seems to have aroused much interest, without arousing much suspicion as regards the life history of other nematodes. It was also known from the work of Wilms, Looss, van Durme and others that *Strongyloides* has a somewhat similar life history, being capable of entering the body through the skin and ultimately reaching the intestine, apparently after following the same course as that of the hookworm. It was felt, however, that these were exceptional cases.

Larval Worms in the Digestive Tract.

The discovery by Neveu-Lemaire of lungworms, *Dictyocaulus filaria*, in the lungs of a fetal sheep indicated that these worms had traveled as larvae from the mother to the fetal lung by way of the blood stream, but as these worms were in the lungs, instead of in the digestive tract, this finding did not seriously upset our belief that nematode worms of the digestive tract when ingested as larvae developed in the digestive tract on arriving there. However, the findings of recent years by Stewart, Ransom and Foster, and Yoshida, to the effect that ascarids when swallowed as larvae do not at once develop in the intestine, but leave it to wander through the body, negotiating the long journey by way of the blood and lymph streams to the lungs, up the air passages to the pharynx, and down the esophagus to the intestines, upset our complacent certainty and assurance in regard to the life history of all nematodes supposed to develop directly to adult worms in the intestine upon the arrival of the larvae there. Probably the only cases in which we can still feel reasonably sure that these larval worms do not leave the digestive tract after arrival are those in which the worms have already undergone their preliminary wanderings in an intermediate host, as in the case of the spiruroid worms. Japanese investigators have shown that whipworms have the migratory habit, a thing which seemed probable in the light of the new discoveries and in view of the well known migratory habits of the larvae and its near relative, *Trichinella spiralis*. So we have evidence now that hookworms, *Strongyloides*, ascarids and whipworms, representatives of the four superfamilies Strongy-

loidea, Rhabdiasoidea, Ascaroidea, and Trichuroidea, have the migratory habit as intracorporeal larvae and are invaders of tissue. In two other important superfamilies of parasitic nematodes, the Filarioidea and Spiruroidea, the larvae are tissue invaders in intermediate hosts, and the larvae and adults are commonly invaders of tissue in the primary hosts. We are, therefore, led to the conclusion that nematodes in general are invaders of tissue, either as adults or larvae, or both. Of the better known forms in this connection we might cite the lungworms, the strongyles and cylicostomes of the horse and his relatives, the nodular worms, the kidney worms of swine, and trichinae as invaders of tissue and destroyers of tissue continuity. We are as yet without evidence in regard to the activities of the larvae of the superfamily Oxyuroidea, including the Oxyuridea and the Heterakidae, after their entrance into their host, but in view of the findings in other superfamilies, it appears more likely that these worms will also show the wandering habits of tissue invaders than that they will prove exceptions in this respect.

As clinical evidence in connection with the relations of nematodes to other disease factors, the following points might be mentioned in passing: It has long been suspected that the high temperatures associated with trichinosis might be due to bacteria carried into the tissues by the invading female trichinae and the larvae, since simple worm infestations are usually afebrile affairs, and Trejo states that *Strongyloides* increases the sepsis due to intestinal toxins. So much for the nematodes as tissue invaders.

Nematodes Not the Only Tissue Invaders.

A similar case may be made out against the trematodes or flukes. It has been found that the common liver fluke of sheep and cattle, *Fasciola hepatica,* after entering the digestive tract, burrows through the intestinal wall to the abdominal cavity, wanders about on the viscera, enters the liver through the capsule, and there develops to the adult worm, some worms missing the liver and going astray in other tissues. The lung fluke, *Paragonimus,* also wanders through the tissues to attain its ultimate situation in the lungs, but may also go astray, sometimes arriving in the brain. The blood flukes, *Schistosoma,* enter the body through the skin or the digestive tract and then make their way, mostly by way of the blood stream, to the point in the circulatory system where they complete their development, and their eggs penetrate the tissues to make their escape to the exterior in the urine or feces.

Cestodes or tapeworms are well known as wandering invaders of tissue while in their larval stages, developing to "bladderworms" of some type, as a rule.

Lesions Caused by Migratory Worm Parasites or Larvae.

In the course of their wanderings, larval nematodes, flukes and tapeworms and the eggs of blood flukes give rise to distinct lesions, such as the cutaneous conditions present in severe cases of ground itch or dew itch from the entrance of hookworm larvae through the skin, the pulmonary hemorrhages and pneumonia in swine ascariasis, the severe lesions of the bladder and rectum in schistosomiasis, and the destruction of tissue by such tapeworm larvae as hydatids, the gid bladderworm, etc.

All of the foregoing discoveries in the field of parasitology open up the subject of the migrating larva as a pathological agent of far greater importance than has previously been suspected. The wandering habit is much more common than we had supposed; the traumatic injury is greater, and evidence is just coming in to support the idea that larvae leaving the intestine with its rich content of micro-organisms, or leaving the dirty skin, commonly soiled with manure in the case of our live stock, carry with them into the tissues these micro-organisms, including the pathogenic forms, or open the tissues to attack at the points entered by the worms. It is impossible at this time to evaluate this damage, but in addition to the damage by the adult worms, no small item, as we know, for many species, and almost the only item we have been in the habit of considering heretofore, we must now take into consideration the heretofore neglected and as yet little known item of damage done by larval worms. We may find that this feature will acount for much that is still obscure in connection with diseases due to animal parasites and to other disease factors. It is beginning to be fairly evident that almost all parasitic worms are tissue invaders while in their larval stages. The possibility that these larval worms may inoculate bacteria, or in some way render otherwise resistant animals or tissues susceptible to invasion by germs, is a fascinating field for investigation. Enough is known to make it fairly evident that we have underestimated rather than overestimated the importance of parasites and the subject of parasitology.

Queries and Answers

Nasal Polypus

AN interesting case has come to my attention, which has been puzzling me, and I would be pleased to have advice as to diagnosis, prognosis and treatment.

About three weeks ago I was called to see a pure-bred shorthorn cow about four years old, which I found to be normal in every way except for a loud, snoring noise upon inspiration, not evidenced at all times, but more especially when the head was extended or when stretched in reaching for food of any kind. The animal eats and drinks a normal amount; bowel evacuations normal; and is in a seemingly thrifty, well-kept condition. The client had noticed the condition for some six or eight weeks previous and thought it was getting worse.

There was no discharge from the nostrils, and upon auscultation the lungs disclosed no abnormalities. A stimulating liniment applied to the throat region (there was no swelling) and inhalations of oil of wormwood in hot water have been the treatment, with some but not noticeable improvement. The animal has good quarters and is well cared for.

Manual examination of the pharynx reveals no abscess formation, and I do not believe there are any growths in the nares. What is your opinion?—W. T. W., Minnesota.

Reply: We think the condition described by you is due to some neoplasm, probably of a polypoid nature. Inasmuch as this snoring rarely occurs in both nostrils, you may be able to make a definite diagnosis by closing the affected nostril with your hand, and if the cause of the snoring is within the nasal chambers, such closure should cause the snoring noise to cease.

Should you not be able to determine which nostril is the offending one, try closing first one and then the other. I would also suggest that you make a thorough examination of the nasal chambers with an electric searchlight. If this fails to reveal the growth or perhaps a tumefaction of the mucous membrane covering the turbinal bones, then I would suggest using a speculum and making a digital examination of the posterior nares.

The prognosis is favorable, provided it is a neoplasm which is within reach. If it is a growth of any kind, surgical treatment is the only one of promise. Polypoid growths are as a rule easily removed by means of an ecraseur or a wire snare.—E. L. Q.

Extirpation Best Remedy for Growth of Tubercular Origin.

I have a case that I have diagnosed as a fibrous tumor in a cow. The tumor is located at the junction of the neck and shoulder on the left side. I believe it is due to trauma from pressure or bruising against the stanchion. It is about six inches wide, 12 inches long and 3½ to 4 inches high.

It is my judgment that this case is inoperable owing to the physical condition of the cow and its value at the present time, which must be considered. Exploration failed to disclose a pus cavity. I advised the owner that the reduction of this enlargement must be by external application and have applied a cantharides blister to this end.

Can you suggest a more efficacious application for the reduction of this enlargement?

On page 110 of Quitman's Materia Medica the following is recommended for swellings and enlargements:

℞ Ungt. hydrarg. nitratis..... ʒ j
Oleati hydrarg. ..... ʒ ij
Adipis lanae hydrosis..... ʒ iij-iv

Would you suggest using it in this case, or can you suggest something that it superior to it?

I see one writer advises the use of formalin in mastitis. Having never used it and not having seen it used; I am requesting you to advise me as to the advisability of its use in such cases.—J. S., Illinois.

Reply: In my opinion the case you describe is undoubtedly a surgical case. I do not believe that any medicinal treatment, aside from the use of caustics, will remove such a large growth.

Are you sure that it is not of tubercular origin? I would advise, if you have not already done so, that you give this cow the tuberculin

test. If the growth is of tubercular origin, complete extirpation will probably effect a cure unless there are other foci of the disease. Should you decide that it is not of tubercular origin and wish to use local applications, the one you mention in your letter taken from my book, will be found a most powerful resolvent. Or, another one that is also highly efficacious is composed of potassium iodid, one ounce, glycerine sufficient to make a solution and mix thoroughly with mercurial ointment (50 percent), four ounces, rub in thoroughly after clipping the hair, and repeat every five or six days.

Should you wish to use caustic treatment, the least painful would be to make a deep incision in the center of the growth, extending very nearly or entirely to the back of the tumor—make the incision about two inches wide, then insert one ounce of powdered bichlorid of mercury, which should be rolled in four thicknesses of tissue paper and made into the shape or form of a suppository, or, if you wish, you may use a gelatin capsule, instead of paper. After the insertion, place a couple of sutures across the wound and then grease the skin heavily with petrolatum from the wound down to the foot, keeping the skin greased for seven or eight days, at the end of which time you will find, if you have proceeded properly, that you will be able to remove what is left of the tumor very conveniently with your fingers or with forceps. The wound requires no after treatment.

Replying to your second query regarding the use of formalin in mastitis, will say, that it is giving very good results, if the case is gotten sufficiently early.

As to dosage, usually one-half ounce is administered three times daily in sloppy feed. This dose is usually given for the first twenty-four to forty-eight hours, then it is usually cut down to twice daily, finally once daily. This does not, however, preclude or exclude the usual local treatment, such as suspension, etc.—E. L. Q.

Histoid Neoplasm.

History: Large grade Holstein cow, about 6 years old. In September, 1920, I treated the cow for impaction of the rumen. Late in October I was called to treat her for a mild case of pneumonia. She responded nicely to treatment in both cases. In early November, 1920, she gave birth to a nice calf. Three weeks later she developed a small enlargement between the fore legs about the size of a man's fist, apparently between the skin and muscle. I could feel nothing characteristic so told the owner to let me know if it got any larger. Six days later he called me back; the enlargement was as large as a two-gallon water bucket and very hard, not painful and firmly attached, cow otherwise normal. I punctured with a small trocar and canula and got nothing; as the firmness seemed to extend the entire distance, I ran the canula in about six inches.

Etiology: Cow had been eating from a trough that caused her to rub on the manger, but the owner said she had never been hurt.

Diagnosis: I didn't make one.

Prognosis: Gave a favorable one.

Treatment: Blistered with Cantharol.

Results: Saw no change for about ten days. Then it started to leave and in one week was gone, all signs having disappeared except the marks from the blister. The enlargement never at any time became soft, nor was there any change in the cow to indicate any disease.

I have seen the cow and calf several times since and both seem to be well. The cow is and was throughout the time in a very good condition.

I cannot understand the firmness of the enlargement, the absence of all other symptoms, and the quickness with which it disappeared. Who will explain it? G. A. FERGUSON.

Danville, Va.

Hematuria in Cattle.

I was called to see two cows which died with hematuria. The first one lived 48 hours after first symptoms, and the second only lived five or six hours. The farmer has 30 or 40 head of cattle; the two which died were and all the rest are in very good condition and are not on low ground. The feed is all raised on high ground. These cattle are being fed ensilage twice daily with oat straw and clover hay. There are no weeds in the feed.

I wish to ask if there has been any report of ensilage causing this trouble? If you can give me any light on this subject kindly do so.—H. H., Indiana.

Reply: Your information is so meager it is absolutely impossible to make a diagnosis, as you mention no symptoms except the bloody urine. You undoubtedly are aware this condition is a symptom and not a disease within itself; neither is it symptomatic of any one disease, as it may occur in a great number of disorders such as inflammation of the kidneys, both acute and chronic and injuries to the kidneys. It is also

a common symptom in various acute infectious diseases such as purpura, anthrax, hemorrhagic septicemia, piroplasmosis and cachectic diseases in general. Also, it occasionally occurs in forage poisoning.

Should you have another death in this herd we would suggest that you make a thorough postmortem examination and unless the lesions found point clearly to some one disease, such as hemorrhagic septicemia, which we suspect in your cases, you had better send blood samples and specimens from some of the organs and tissues for laboratory examination. We would suggest, however, that you examine these patients carefully for hemorrhagic septicemia.

Also should you have any more of this trouble immediately give hypodermatically 45 to 60 grains of sodium cacodylate dissolved in one ounce of sterile water. On account of the peracuteness of the attacks described by you we recommend that it be administered intraveniously, otherwise the subcutaneous injection might serve you well.—E. L. Q.

Mineral Requirements for Goats.

I have been very much interested in reading Dr. A. T. Peter's article, "Mineral Requirements in Animal Foods," in VETERINARY MEDICINE, and it has impressed me as of particular interesting for the owners of our fine milk goats in this section. Most of them are confined, and are deprived of their natural food usually gathered by browsing from the mountainside. They are forced fed to induce heavy production of milk. Surely if any animal would need assistance along this line it would be the goat.

By way of illustrating my point I cite the instance of an animal weighing about 150 pounds that, after developing five large kids, produced within a little over 300 days 3,711 pounds of milk. Should she not have all assistance possible? Please inform us through the columns of your journal what combination of minerals you would suggest with instructions as to dose. I would like to give it a trial.—J. H. H., California.

Reply: Regarding mineral food for goats, phosphorus and calcium can be administered combined as precipitated phosphate of calcium, which you no doubt are aware is an official drug and not at all expensive. Or, should you desire to use it in a cheaper form, you could use it in the form of a fine ground bone meal—sometimes calcium carbonate is added, but this usually is not required. If there is a tendency towards anemia then iron may be used, the cheapest form of which would be perhaps the sulphate.

As to the quantity of calcium phosphate for sheep, about two drams or two teaspoonfuls two or three times daily, which may be combined with the food, will be sufficient. Calcium carbonate, should you decide to use that, should be given in doses of one to two teaspoonfuls or drams.—E. L. Q.

Osteosarcoma in Cow.

I was recently called to see a black cow seven years old. The owner said he thought she had "lumpy jaw." Examination revealed an undue secretion of saliva from the mouth, so much so that the manger was fairly flooded with it. The lump on the jaw referred to by the owner proved to be just a cud of partially masticated food which we carefully removed. This led me to suspect bad teeth, which we examined, finding some little projections which were removed with the float. On removing the cud I noticed considerable fever on that side of the mouth. There were no loose or decayed teeth.

The ear and eye on the same side were badly affected, the ear drooping until it hung almost straight down and the eye weeping and almost closed. The temperature and pulse were normal. The animal would eat some, but with great difficulty. I tried gentian, nux and iron, but without effect. The cow gradually wasted away until she had to be destroyed.

Would you kindly advise me what your diagnosis is and advise treatment?—O. B. C., Canada.

Reply: It is our opinion that your patient was afflicted with osteosarcoma, which probably was located in the frontal and possibly the superior maxillary sinus. If our diagnosis is correct treatment would have been of no avail.—E. L. Q.

Purulent Conjunctivitis in Dog.

I have a client who has a six-year-old registered Airedale that has a purulent conjunctivitis. The eyes are congested, slightly swollen and discharge a creamy pus. This dog is in a plethoric condition, with appetite and feces normal. Besides getting his regular food he runs around town and visits all the garbage cans.

The client has taken this dog to two different kennels in Ohio. He has been treated for worms. Also, treatment was given for the eyes, with no results as far as the eyes are concerned. He has plenty of pep and seems in good health,

with the exception of the eyes. I would appreciate a diagnosis and line of treatment. Or if you think it would be better I will send you some of the pus from his eyes for a laboratory diagnosis. For the plethoric condition, I have advised one dram doses epsom salts, in capsules, once a day. I prescribed no treatment for the eyes except a boric acid solution.—F. A. S., Michigan.

Reply: A laboratory diagnosis is not required. The condition described by you is a very common one among dogs. The eyes are infected with the common or usual pus organisms. Your diagnosis of purulent conjunctivitis is correct unless the cornea is involved, of which you make no mention. You should carefully examine the cornea to ascertain if there is an ulcer on it.

Treatment: Purchase some human ophthalmic tubes of yellow oxide of mercury ointment, 2 percent strength, and after thoroughly washing the pus and mucus from the eyes, install a little of the ointment under the eyelids by means of the special pipe furnished with each tube; then gently massage the lids so as to spread the ointment all over the eyes and the conjunctival membrane. This should be done twice daily. Should this fail after 10 days' trial, procure some "conjunctivitis ointment" (Mulford or other reliable make), also in the ophthalmic tubes and use it in the same manner.

If there is ulceration of the cornea make a small absorbent cotton swab on a match, dip this in full strength tincture of iodine and touch up the ulcer every other day, continuing with the ointment.

For the plethora or obesity, whichever it is, administer three grains of thyroid extract three times daily. This may most conveniently be procured and used in one and two grain tablets, being crumbled up and mixed with the dog's food, although many dogs will eat them from the hand.—E. L. Q.

Operation for Dimples or "Back Tie" in Show Cattle.

Can you refer me to a work on surgery which gives the technic of operating on show cattle, for what is commonly called "tied back," the skin having grown fast to the spinous processes. If you cannot refer me to a book or to an article in VETERINARY MEDICINE, please describe the operation.—J. L. H., Indiana.

Reply: We do not know of any work on surgery that describes the operation for remedying the condition known as dimples or "back tie" in cattle. We have searched our files back to 1912 and do not find that an article describing the operation has ever been published in VETERINARY MEDICINE. However, the condition and the operation are both simple.

The condition is caused by fibrous tissue binding the skin to the spinous processes of the vertebrae, which prevents the usual subcutaneous deposits of fat at these points.

The operation is performed as follows and must be done with the strictest possible regard for surgical cleanliness. Thoroughly cleanse and disinfect the skin of the affected area, then at the margin of the bound-down skin shave or clip the hair away; next, a small incision one-half to three-fourths of an inch in length is made through the skin and, with a specially devised knife, known as a tie-knife, which is inserted just beneath the skin, the fibrous bands are severed until the skin of the affected area is loosened.

The knife used is 18 inches long, made with a double-edged hook blade on the end, similar in shape to some castrating or embryotomy knives and it has a slightly flexible shank.—E. L. Q.

Hog-Cholera Aggressin.

Is there any work being done in the United States on hog-cholera aggressin?—T. T., Philippine Islands.

Reply: Regarding your query on hog-cholera aggressin. Dr. M. Dorset, Chief of Biochemic Division of the Bureau of Animal Industry, U. S. Department of Agriculture, Washington, D. C., states as follows:

This query is difficult to answer because it is not plain what is meant by hog-cholera aggressin. In the United States I believe the term "aggressin" is generally employed to indicate the expressed and filtered body fluids or muscle juice of animals affected with certain specific diseases. Much work has, of course, been done in the past with such fluids obtained from hogs affected with cholera, and the whole muscle or the entire ground organs of infected animals have likewise been used, both in their ordinary form, as well as after being subjected to various processes of attenuation, the idea being, of course, to produce a reliable vaccine. Up to the present time, so far as I am aware, no one has succeeded in producing a safe and reliable vaccine against hog cholera by such methods.

Every man found guilty in my court of cruelty to animals must go to jail.—Judge Ben Lindsey, Denver.

Pointed Opinions on Live Topics

By READERS of VETERINARY MEDICINE

Method of Checking Hog-Cholera Immunity

SINCE early in 1912 we have administered serum-virus to produce immunity against hog cholera. The method has come into general use and today we have very few skeptics. We do not, however, obtain the uniform results that were hoped for by the use of this method. The existence of other diseases which experts are unable to differentiate from cholera on postmortem examination may account for the breaks that occur after vaccination. This point we will relegate to more scientific men for decision.

> It is in reports like those of this department that the current history of the progress of veterinary science is written. Are you leaving a record of your experience which will help others, as you have been aided by these and other clinical reports? If not, you are earnestly invited to contribute from your experience that this department may be of the greatest service to its readers. By so doing you will earn the lasting gratitude of those who are aided by your suggestions.

In this article we will deal with immunity alone. After vaccinating hogs with the serum-virus method we presume that we obtain immunity, and in a vast number of cases exposure of the vaccinated animals to cholera-sick herds has demonstrated their immunity. Why should we not know or ascertain the percentage of herds that are immune? This may be demonstrated at very small expense and with very little trouble to the practitioner. A complete record should be kept of all hogs vaccinated, the serial number of the serum and virus, date of production of the virus, and expiration date and license number under which both are produced.

After a lapse of ten days from the time of vaccination, the duration of the immunity received depends on the virulence of the virus. While many well-founded claims have been made that in some instances serum alone will protect hogs for 90 days, many breaks in vaccinated herds have occurred in from three weeks to eight months after the use of serum-virus.

The percentage of herds acquiring immunity after the serum-virus treatment may be ascertained by the following method: Vaccinating several hundred hogs with the same serial number of virus will simplify the method to some extent. If 500 were treated with the same series of virus the chances are that they would be comprised in six to twelve herds or more.

From 20 to 30 days after vaccinating select three pigs and isolate them from the herd, marking them for identification. Take their temperatures and gives virus alone. In 60 to 70 days select three from another herd treated with the same series of virus, and give virus alone. In from 90 to 100 days select three from another of the herds, giving virus alone; and from 120 to 140 days select three from the fourth herd, giving virus alone. If the twelve pigs selected from the four herds do not show cholera from the injection of a virulent virus alone at the periods indicated it would be safe to assume that the 500 treated with that series of virus are immune. If three should get sick and die at any of the tests, others should be selected from the other herds and tested. By this method we may hope to establish the percentage of herds that acquire immunity from hog cholera by the serum-virus treatment. All hog breeders and feeders will at once recognize the value of this method and will be willing to sacrifive three pigs to ascertain that they have no protection on the remainder of the herds. The veterinarian will have a record, in a case of a break, that will establish the fact that the herds were immune and will show beyond a doubt that he is dealing with diseases that have no relation to cholera.

The company which furnished the serum will be protected from a law suit that may come from such breaks, as a record could be produced showing that the product is virulent and that the series of virus did produce immunity at the stated periods. On the other hand, the method would also act as a check in the opposite direction, i. e., where defective serum-virus was used.

This method we hope will be of some value in

differentiating some of the diseases complicating hog cholera that we are dealing with today, or that it will be the means of eliminating some of them entirely. The virus used for the testing should be of known virulence, or, if commercial virus, it should be administered alone to a susceptible pig to establish the virulence at the time of testing.

If it is found that 5 or 10 percent of the herds are not immune there is something wrong. If the fault is due to the method of transportation of the serum-virus, to its handling by the veterinarian or to faulty technic, or to the strain of virus produced or whatever it may be, the fault must be corrected. If it is possible to immunize a large percentage of herds that are subjected to the serum-virus treatment it must be possible to bring it to 99 or 100 percent.

We are at present doing some work along these lines, but as yet we have not a record sufficient to be of any great value, but by another year we hope to have a record that will be of unquestioned value. J. F. GILLESPIE.

Tuscola, Ill.

Strongylus Paradoxus Causes Hog Cholera Break.

Referring to an article on page 90 of the February journal, "Important and Perplexing Diseases of Swine," following vaccination, I have had experience with said perplexing diseases in this community and finally discovered the cause. Whether my findings apply to other communities or districts, I cannot say.

I had three herds "break" as veterinary practitioners term it. I had vaccinated all three herds with the triple treatment (serum, virus and bacterin) months before the break occurred. I found on postmortem examination that these animals had succumbed to verminous pneumonia, caused by the (Strongylus paradoxus) lung worm of swine. By tracing out the bronchial tree to the terminal bronchi, if the worms are present, close observation will disclose small thread-like worms ranging from one-fourth to one inch in length. They are sometimes found in groups or clusters, and the operator must be very alert and observant or he will overlook these parasites.

The smaller pigs are the first to show symptoms and succumb rapidly. The symptoms are typical of pneumonia-cough, loss of appetite, drooping etc. The older hogs will not break down as readily as the pigs, but may succumb if they are not treated.

Treatment: Isolate the affected animals, especially the small pigs. Place them in a clean, warm, dry place, and hope for the best.

Medicinal treatment seems to be of no value.

Paris, Ky. W. J. KIFF, D. V. M.

Comment: We would suggest a trial of the intratracheal injection of pure benzine. About one-half to one dram injected slowly and repeated in a week.—E. L. Q.

Apparatus for Impregnating Several Cows From One Service.

I have recently devised a system for impregnating cows which might prove of interest to the profession. The outfit consists of a small article which creates a vacuum by being attached to a water tap. Dentists use this to remove saliva from the mouth, and physicians use it in surgical work. This, in turn, is hitched to a gallon bottle by rubber tubing in order to stabilize the vacuum. This is then attached to a 3-ounce bottle and in turn (as used in sterility work) to the small uterine catheter by a short tube. The catheter is inserted into the vagina after the cow has been served, and the bottle is filled with semen in a very short time; then without drawing the arm from the vagina the catheter is inserted into the uterus and a milk fever bulb or air compressor is hitched on to the bottle and the semen forced into the uterus by one or two squeezes of the bulb. The regular Knowles forceps are used in inserting the catheter into the uterus.

In regulating the dosage I have been pinching the tube after a certain amount of semen has flowed from the bottle and while it was being transferred from one cow to another. The bottle has a cork with the inlet tube projecting about half an inch into the bottle for collecting the semen, and the second cork has the outlet tube projecting to the bottom of the bottle for expelling the semen. The bottle and tubes are kept in water at body temperature while not in use.

The small uterine catheter might be improved for this purpose by eliminating the return-flow principle and by having the space blocked off between the inner and outer tube so the semen cannot collect in this space. Then if a round hole was made directly on the end of the catheter the inner tube might be pushed forward so that it is flush with the outer tube and the semen could be discharged directly forward. For collecting the semen the outer tube is necessary in order to protect the mucous folds from blocking the tube.

I have only worked on about a dozen cows and

have been impregnating three cows from one service.

It seems to me that if artificial impregnation proves practical it will increase the usefulness of valuable bulls and prove especially valuable to dairymen who are having breeding troubles.

Pasadena, Calif. J. B. BELL, D. V. M.

Retained Placenta Extraordinary.

Believing the experience as detailed in the following lines to be somewhat unusual, I herewith present them to readers of VETERINARY MEDICINE.

I autopsied a case recently, a cow which had been ailing since she had freshened ten weeks previous. I was called to see the cow about four weeks previous to making the autopsy and from the history of the case and the symptoms presented I made a diagnosis of "foreign body in the stomach which had probably punctured the wall and was affecting the heart," or, in other words, the case seemed to be one of traumatic pericarditis.

Also, on a subsequent visit a few days later, I added to the foregoing diagnosis that the animal probably had something in the stomach which was blocking the outlet, as it was impossible to secure bowel action (I thought of a calculus or a hair ball).

The owner insisted on treatment of the cow, which consisted of purgatives, intestinal stimulants, and general stimulants, as he desired to let her live as long as possible in the hope that she might ultimately recover. However, she died, and on autopsy I found a twelve-penny nail through the wall of the reticulum which had caused an inflammation of it and which inflammation extended into and involved the pericardium. I also found in the stomach the placenta which had become by the action of the stomach rolled up into a firm ball that almost filled a pint jar.

I am preserving it in alcohol as a memento, as I did not think it possible for a placenta to remain in the stomach two and a half months and still be in firm condition.

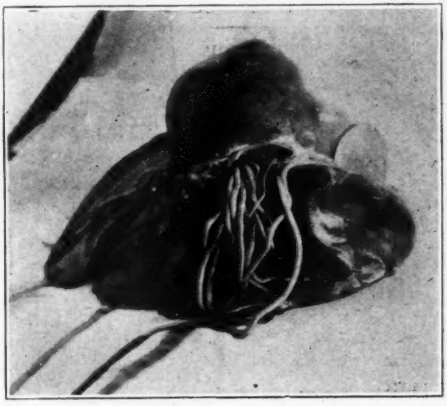
My deductions of the case are that at the time of parturition the cow had the nail in the stomach, which had not yet caused trouble, and that the contractions of the abdominal muscles in the labor pains caused the nail to puncture the wall of the reticulum and that the shock from the puncture and the resulting inflammatory reaction caused the digestive disturbance (causing the cow to be ailing as expressed by the owner) which disturbance gradually became intensified as time went on until it finally resulted in complete paralysis of the digestive function and of peristalsis.

However, I cannot account for the fact that the placenta which had been swallowed by the cow ten weeks before, remained in such a good state of preservation, unless perhaps the digestive fluids before paralysis of digestion occurred, in some manner acted as a preservative against decomposition, yet not being active enough to digest it. And the fact that the cow being non-carnivorous would perhaps also account for the non-digestion of the placenta.

Collinsville, Ill. C. S. WATT, D. V. M.

Ascarid Infestation of Liver of Hog.

The illustration shows a hog's liver infested with worms. They had left the duodenum and migrated into the gall-bladder and practically every one of the gall-ducts contained from one to three worms. These worms are the ascaris suilla and are from six to ten inches long. I



Ascarid Infestation of Liver of Hog.

have autopsied nine hogs so affected, the findings being the same as the case cited.

I have used iron, santonin, areca nut, creosote, chloroform, glycerin and croton oil in various combinations. The owner has twelve more hogs similarly affected that I am treating. A few may recover; if they do I will have to conclude that the worms failed to reach the liver.

I have had eighteen years' practice and this is the first time I have ever encountered anything like this.

The hogs weigh from seventy to ninety pounds. They have been fed on corn and all the sweet

milk they could drink. They are fed on a concrete floor cleaned every day. They have a good bed of straw and it is renewed twice a week, or oftener if necessary. They run in a small pasture of three acres of blue grass and wild grass.

If anyone has had a similar experience, I would like to hear from them, through VETERINARY MEDICINE.—L. H. T., Kansas.

Operation to Remove Obstruction to Sight.

Regarding the operation to remove obstruction to sight, reported on page 55 of the February issue of VETERINARY MEDICINE, by F. M. Mc., Michigan, I would say that I have performed a similar operation on many fine wool sheep and lambs, with very gratifying results, many of the animals having taken first prize in the show ring after they had been operated upon. I trust others will be encouraged to perform this most useful and simple operation. J. H. TAYLOR.

Henrietta, N. Y.

Balsam of Myrrh Does Everything but Tune the Piano—Desiccant Versus Caustic.

In the January VETERINARY MEDICINE I noticed, in answer to a query regarding balsam of myrrh that Dr. Quitman states that he has never heard of it and has no idea what it is. I will say that Hanford's Balsam of Myrrh is a proprietary preparation which has been sold by every blacksmith and at every harness shop and livery barn in this section of the country as long as I can remember and is widely advertised by large cards on posts and dead walls wherever one may go. I find that it is made by the G. C. Hanford Co., Syracuse, N. Y., and according to the label it contains 84 percent wood alcohol and the price is 65 cents for a 3.5 ounce bottle. Regarding its virtues I will copy from the label: For Domestic Animals. "An external application for galls, sore breast, nail-in-foot, calks, bruises, swellings, sprains, shoulder strains, inflammation and inflamed wounds; also pipe sores, fistula, poll-evil, screw worm, scratches, mud fever, thrush, old sores, flesh wounds and frost bites." "Also spavin and ringbone (in the early stages) and for wind-galls. Will not remove the hair if applied once a day and well rubbed in. Valuable to dairymen and farmers for caked udder and spider, sore teats, fouls in hoofs of cattle, also foot-rot in sheep." For the Human System. "An external application for cuts, burns, bruises, sprains, strains, swellings, stiff neck, non-diphtheretic sore throat, any superficial pain or lameness, earache, muscular soreness from strains or sprains, such as lame back or shoulder or sprained ankle or wrist, muscular rheumatism. Also for piles, corns, bunions, chilblains, poisoned wounds, as mosquito bites and stings of bees and venomous insects, rusty nail wounds, etc., old sores, indolent ulcers and fever sores." It must be SOME remedy.

In the same issue Dr. Quitman states that his drying powder is much better for removing excessive granulations than any caustics. I would like to take issue with him on this point. These cases used to be a thorn in my side and I used every remedy which I had ever heard of, including Dr. Quitman's drying powder, and all with poor results. I tried arsenic in paste form and got better results than from any other method and when I began using a paste made by one of the large veterinary supply houses my troubles were at an end and now I am willing to state that I can remove any of these growths satisfactorily, regardless of size. Two of the large veterinary supply houses make this preparation, one being equally as good as the other.

Ortonville, Minn. E. N. SCHOEN.

Comment: We thank you very much for your communication in regard to Hanford's Balsam of Myrrh. We note that it does pretty nearly everything except tune the family piano. If you will refer to the query in regard to the preparation and my answer to the same, you will note that I inform the querist that Balsam of Myrrh must be a proprietary preparation and as there are many proprietary preparations that are sold and perhaps have a large sale in one section of the country and are unknown in other sections and inasmuch as so many proprietary preparations have names that are entirely foreign to the contents, we do not make any pretense of knowing the composition of the thousands of such nostrums on the market; however, we are glad to have the information furnished by you.

Regarding the second part of your letter, relating to caustics versus the desiccant powder recommended by me, I still contend that in the form of exuberant granulations commonly known as grapes, you will find the powder far superior to any form of caustic, whether in form of paste or otherwise. Also, for your information, since you have been so kind to me, while you make reference to arsenic in paste form, you do not say what formula you tried and would inform you that the arsenic pastes put out by the two

highly reputable concerns mentioned by you, were more than likely made after the formula I gave in my lectures to the students of the Chicago Veterinary College for many years back and I believe that if you care to you could save yourself considerable money by making your next arsenic paste as follows:

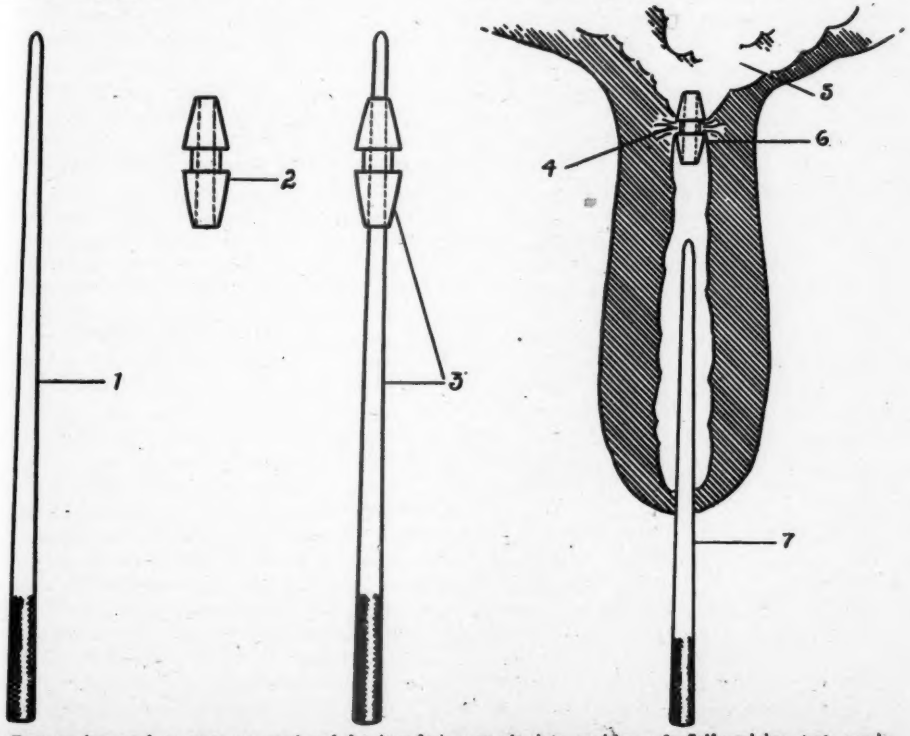
Arsenic trioxide one part, wheat flour four or five parts, water sufficient to make a paste. It is possible that the supply houses making this preparation may use glycerin instead of water, which would prevent the paste from drying out so rapidly or perhaps they may use some oil or gum. I do not know whether these concerns give the mixture an odor and color or not, but such could be added if desired.—E. L. Q.

Stricture of the Lactiferous Duct in Cows and Its Treatment.

Stricture of the milk-duct is a pathological condition, wherein the milk-duct is closed by the constriction of bands of connective tissue which develop as a result of structural changes in the wall of the duct.

The cause of stricture of the lactiferous duct is both congenital and traumatic. In most cases it is a sequel to catarrhal mastitis. My observation is that the process of hand milking is a common cause, especially in cows with small teats, due to constant irritation. In cases that are congenital the opening into the canal closes without any apparent cause.

Pathology: The mucous membrane and submucous tissue of the milk-duct become thickened in inflammation or as a result of injury which results usually in proliferation of the connective-tissue cells. Later the newly formed fibrous tissue contracts and closes the canal. Stricture of the lactiferous duct may occur at the distal end of the teats or at the point where the canal passes over into the sinus. The former condition has been successfully treated and consequently will not be discussed in this article. The latter and more difficult form to treat is the one which will be discussed. In some cases the stricture may be complete, causing a total cessation of the flow of milk through the canal, while in others



1—Teat trochar used to open up canal and for introducing canula into position. 2—Self-retaining teat canula. 3—Self-retaining teat canula and trochar ready for use. 4—Stricture. 5—Milk sinus. 6—Canula in position, showing how the stricture acts to hold it in position 7—Trochar being removed after releasing canula.

it may be partial only and the teat will fill slowly with milk.

Anatomy: The upper end of the milk-duct is wide and continuous with the milk sinus; the lower end is narrow and closed by a sphincter of unstriped muscle. It is lined by a mucous membrane which is covered with a stratified squamous epithelium. Occasionally there will be a small number of muscle fibres encircling the duct at the point where it passes over into the sinus. This evidently is the result of a slight abnormality in development. These cases are congenital and are predisposed to stricture.

Symptoms: The first symptom to be observed is usually a difficulty in the process of milking. The teat will either not fill with milk in complete stricture or will fill very slowly in partial stricture so that the process of milking becomes difficult and very slow. Upon closer examination there will be found an enlargement in the teat at about the point where the teat joins the udder. This enlargement varies in size from that of a small bean to that of a hazelnut, depending upon the stage of development. In the case of a complete stricture when an attempt is made at milking, it will be found that the milk does not come out of the milk sinus into the duct. When attempting to introduce a milk-tube into the sinus, great difficulty will be experienced, as in some cases the walls of the duct have adhered together, or the pressure of the stricture upon the walls will offer considerable resistance. After passing the milk-tube, in cases where the gland is active, the milk will flow from the quarter freely, but upon removing the tube from the teat, the same difficulty will be experienced, thus constituting a recurrent stricture.

Treatment: Many instruments have been devised and many different operations have been attempted with very little success; in fact so unsuccessful have been the operations attempted that when in 1918, I, endeavoring to find a successful operation and a teat instrument that would satisfactorily overcome this condition in one of my valuable cows, met only with disappointment. Upon addressing the Michigan Agricultural College in the spring of 1920, regarding this condition, I received a reply stating that this condition had not to their knowledge been successfully treated. After losing the affected quarter in one valuable cow, and later being confronted with the perplexing situation of a stricture in each hind teat of another, I decided to do some experimenting upon my own cows. To this end I have devised an instrument that I have used in successfully operating upon several cases.

Operation: Properly restraining the cow in the recumbent position, being sure to have the affected teat on the upper side, the teat stricture is located and the duct opened by the use of the trochar (Fig. 1), which is later used in introducing the new instrument called the "teat canula" (Fig. 2). It would be well to mention at this point that one of the essential steps in the operation is to establish an opening into the milk sinus. After this has been accomplished and the instrument has been properly sterilized, it is ready to be introduced. This part of the operation is similar to introducing a milk-tube up to that point where the end of the trochar comes in contact with the stricture. At this point care should be exercised in placing the end of the trochar in the opening formerly made by it. Considerable force will need to be applied, perhaps, to introduce the trochar and canula (Fig. 3) into the milk-duct through the sphincter at the end of the teat. After this has been accomplished, the instrument will glide smoothly through the canal until it reaches the stricture. After placing the end of the trochar through the opening formerly made by it, considerable force should be applied to force the canula into the proper position. This is done by gripping the teat with the thumb and finger in the region just above the stricture and by applying force to the trochar, at the same time giving it a twist. When the canula passes through the stricture ,one can tell by the lessening of resistance that it has reached its position. The next step in the operation is to release the canula from the trochar. This is done by gripping the canula through the wall of the teat by the thumb and finger, holding firmly and at the same time applying traction to the trochar with the other hand and giving it a twist. The object of the operation is to place the canula so that one knob will be above and one below the stricture. The stricture later contracting down upon the constricted portion of the canula, holding it fixed in its position. Following the operation for the first two or three days, there will be a tendency for the instrument to slip down out of its position, but it can be easily returned by the use of the trochar. This should be attended to at once and the instrument kept in its position until the stricture has sufficient time to contract to the extent that it will hold the canula in position.

In case that it should become necessary to remove the teat canula from the teat, it can be done by inserting the trochar through the canal

into the canula. Gripping the canula through the wall of the teat, with the thumb and finger, the trochar is forced upward with a twist. The canula being forced in position upon the trochar, is held firmly in position, due to friction. By applying traction to the trochar with the right hand and with the left hand, using the thumb and finger to force the canula downward, it can be removed without difficulty. Care should be exercised in milking for the first week or so, to avoid displacing the instrument. As soon as the stricture has contracted upon the constricted portion of the canula sufficient to fix it in its position, the operation is complete. One of the striking features of the operation is that immediately following the placing of the canula in position, the cow can be milked practically as well as ever. CHARLES B. CONYER, D. V. M.

Richland, Mich.

Therapeutic Suggestions.

In Obstetrics.—Before using pituitrin be sure that the os uteri is dilated; if not, and pituitrin is administered, death of the patient is very likely to occur, due to rupture of the uterus or to shock.

Do not despair of the agent arousing uterine contractions until from three to six doses at one-half hour intervals have been given. It frequently will cause the expulsion of dead fetuses.

In Dystokia.—If the maternal passage is dry or moderately dry do not forget the very great value of lubrication. Petrolatum and castor oil due to their viscidity are the two of choice for this purpose. They should be placed well forward in the passage and the latter in small animals may be injected by means of a syringe.

For General Anesthesia in Swine.—Our choice is the A. C. E. mixture administered by the open drop method, for the following reasons: Ether is too slow and uncertain, especially in swine over a year old. Chloroform is too dangerous and no matter how expertly used unnecessary deaths will result from its use. A mixture of ether and choloroform in equal parts is the next of choice to the A. C. E. mixture, although not quite as safe. Hypodermatic injections of narcotics used in place of anesthetics are not dependable alone, but may be used to augment a general anesthetic and should be administered about one hour previous to the general anesthetic. Chloral hydrate intraperitoneally in swine may be very tardy of action; over three hours may elapse before anesthesia is manifested. Ignorance on this point may cause the surgeon to administer another dose after waiting an hour, and even if smaller than the first dose it is very liable to cause the death of the patient by the cumulative action.

To avoid deaths in swine, or in any species of animals *do not force the anesthetic.* Grandstand or gallery plays to show how quickly you can anesthetize an animal spells death to the patient in too many instances. This may occur at the time of operation or five or six days afterwards from inspiration bronchopneumonia. Go slow; it is better to be *sure* than *sorry.*—E. L. Q.

Dystokia Due to Sysomian Monstrosity.

I was called to see a cow which was having trouble calving. On examination I found the fetus coming with posterior presentation but could not locate the hind legs, so I attached a rope to its trunk and brought it up as far as possible and directed the body through the pelvis and removed

Dr. G. G. Potter and the Sysomian Monstrosity.

this part which consisted of two three-quarter halves grown together along the spines. There were two tails and no sign of any posterior limbs at all. I then went in after the remainder of the fetus and by examination located the two heads, so decided to bring fore limbs first, which I did, and it required very little traction to remove it. I had the heads mounted and think they are a very fine specimen. I might add that the cow was only two days from normal calving, so both heads are fully matured. The cow made a perfect recovery. The accompanying photograph shows the perfect development of the heads.

Delisle, Sask., Can. G. G. POTTER, V. S.

A Certain Way to Remove Sand Impaction.

I have been reading, with the usual interest, the December number of VETERINARY MEDICINE. I note particularly D. R. Cook's account of sand impaction in horses. "Sanded" is a condition we are constantly contending with in Florida, not only in horses and mules, but also in cattle, and I have found it, on postmorten examination, in small pigs.

In these cases, the cecum was found packed full. In my experience, which has covered sixteen years in Florida, I have found only one way to move a real case of "sand," the offending mass being anywhere from forty pounds to one hundred and twenty-three pounds in one body, and that is with a long-handled shovel.

However, the condition can be prevented, and one pound of whole flaxseed, fed once a week, will do it. Dr. Cook's method of rolling the animal will help, but I think he will find a stout pole, with a good husky darky on each end and one in the middle, used to massage the abdomen from before, backward, quite as effective and much easier to apply. FRED W. PORTER.

Tampa, Fla.

Strongylus Armatus in Mules.

Dr. H. C. Rinehart recently reported a serious outbreak of Strongylus armatus infestations in mules. Large numbers of the parasites were found in mesenteric emboli of specimens submitted for laboratory examination. The herd consisted of forty head of two-year-old mules. All animals were thin in flesh and suffered from a mild diarrhea. At the crest of the disease afflicted animals displayed anemic mucous membranes, while following exertion marked symptoms of exhaustion were manifested which terminated fatally in some cases. The affected animals had been grazing on a blue grass pasture during the past summer. A small stream of water passed through the pasture, while spring water was collected in a concrete tank.

The mules were removed from the pasture and given a good quality of mixed hay and oats. Medication consisted of three ounces oil of turpentine, five drams of barbadoes aloe in one pint of linseed oil in addition to oil meal and fenugreek as a base with tartar emetic. Enough of this mixture was given so that each mule received about one ounce of tartar emetic. Following the first treatment the mules were much improved and with few exceptions the diarrhea disappeared. While other outbreaks of this character have been observed by practitioners it seems important at this time to mention the existence of certain parasitic diseases which handicap the production of live stock in the middle west.—*Animal Pathology Exchange*, University of Illinois.

Recurrent Azoturia.

In looking over the October Journal I noticed the article on "Recurrent Attacks of Azoturia" by J. L. S., Canada, who asked for information.

I have had quite a lot of azoturia to deal with in my practice, and my method of handling most of the cases is as follows:

I give a purgative of arecolin, hypodermatically, in one grain doses; and then if I do not get thorough catharsis I follow with eserin, one-half grain, and pilocarpin, one grain, combined. When thoroughly purged, I put them on sulphocarbolate compound, using six thirty-grain tablets at a dose, crushed in bran mashes, followed with hexamethylenamin, using two to three thirty-grain tablets in drinking water three times daily.

For my bad cases, if delirious, I use lobelin sulphate hypodermatically to effect and keep the urine drawn every hour or two, as I find that I get better results than when done every four to six hours. I have never had a recurrent attack when the animal was thoroughly purged.

I have given aloes in a capsule after I had gotten the bowels started in good shape, before using the sulphocarbolates and hexamethylenamin.

I believe the above treatment will apply to the case discussed by J. L. S., Canada.

W. I. P.

Matters of Current Interest

Missouri Valley Meeting Highly Satisfactory.

The winter meeting of the Missouri Valley Veterinary Association held at Kansas City, Mo, Feb. 8, 9 and 10 must be rated as one of the most satisfactory in its history. While the attendance was somewhat less than one year ago, over 200 members and over fifty ladies were present. The first two days of the meeting were devoted to papers and discussions, the third day being devoted entirely to clinical work.

A series of case reports were given by Dr. R. L. Allen of Windsor, Mo. The cases were those of an obscure type of forage poisoning.

A well written paper on "Cornstalk Disease Among Cattle" was presented by H. F. Lienhardt of Manhattan, Kan. Dr. Lienhardt reported on three recent outbreaks of cornstalk disease in cattle, in addition to three previously reported during January. The animals affected showed weakness, wabbly gait, temperatures normal or subnormal and death occurred within a few hours to forty-eight hours. Autopsies revealed numerous hemorrhagic lesions, involving the serous membranes, liver, spleen, pancreas, and the pericardium. Considerable edema, some pneumonia and enteritis were also present. No impaction was found in any case. Bacteriological studies gave negative results, both in culture media and in animal inoculation, material having been taken from the blood and various organs Examination of the feed and feces revealed no bacillus botulinus and filtered extracts of the feed produced no toxemia in guinea pigs. Analyses for prussic acid and nitrates revealed no sufficient cause of toxic action from these sources. In some cases the animals were left in the stalk fields or were replaced by other cattle without further loss. The cause of death in these herds therefore remains unexplained.

Dr. Robert Graham of the University of Illinois followed with a most interesting dissertation on botulism, using lantern slides to show the nature of several experiments carried on. Dr. Graham has discovered bacillus botulinus in numerous feed stuffs and has dealt with a number of outbreaks of this trouble in animals. The laboratory at the University of Illinois is producing a limited quantity of botulinus antitoxin of the polyvalent type, which may be secured for the treatment of animals suffering from botulism. He states that no symptomatic differentiation between type A and type B is attempted, but that the antitoxin now used combines both types and is therefore useful in botulism of either type.

Dr. J. C. Flynn of Kansas City, Mo, presented an interesting paper on "Sarcoptic and Follicular Mange." Sarcoptic mange is characterized in dogs by its ease of transmission, marked irritation of the skin, particularly in such regions as the base of the skull, the back, neck and inner surface of the legs and on the feet. Small nodules are produced by the burrowing habit of the parasite, which later fill with fluid that may become infected with pus-producing bacteria. He regards the odor given off from the lesions as being quite diagnostic. Specimens may be obtained for microscopic examination only by scraping deep enough to open up the burrows of the parasite. This type of mange is treated satisfactorily with lime and sulphur dips and a satisfactory method of applying this treatment is to have certain days set aside for dipping all of the animals under treatment. The dip is placed in a barrel at the proper temperature, each dog being completely submerged, the eyes and mouth being held shut by the operator in order to prevent unnnecessary irritation from the dip. The animals are permitted to dry with the dip on their bodies. The operator protects his person with rubber garments and boots. The average case responds to four dips, while some require eight or ten treatments. Clipping, bathing and brushing the body previous to dipping, aids in the treatment considerably. The yards and premises in general must be also disinfected in order to prevent reinfestation.

Follicular mange, in the doctor's experience, is less easily transmitted, develops more slowly and produces less irritation. The treatment recommended is sponging of the skin freely with a 5 percent solution of formalin, followed in a few minutes with an application of sulphur ointment or vaseline. Two applications each for two weeks will as a rule result in a cure, although

some cases are more persistent and require several treatments. Contrary to the usual belief, Doctor Flynn regards follicular mange as more easily cured than the sarcoptic form.

Dr. W. H. Bailey presented an interesting discussion of "Thyroidectomy in Puppies." This operation is undertaken as an emergency measure to relieve the pressure upon the trachea in very young puppies, which otherwise die from suffocation. Surgical treatment in his hands has been quite satisfactory.

"Modern Biologics" was the title of an ably prepared paper by Dr. E. A. Cahill of Zionsville, Ind. Dr. Cahill set forth in a very forceful manner the principles underlying immunity as affected by various biologic agents. He made a plea for a more thorough understanding on the part of practitioners, of the manner in which various immunizing substances operate, in order that these classes of agents may be used with a greater degree of specificity. His paper comprised one of the best treatises on this subject that has been contributed to veterinary literature.

Dr. S. L. Stewart of Olathe, Kan., read an excellent paper on mammitis in cows. He called attention to the distinctions to be made between different classes of inflammation involving the udder and related structures. His methods of treatment met with general approval and it is hoped that the full text of his paper will be read by the veterinarians upon its appearance in the veterinary press.

The paper by Dr. W. T. Spencer of Lincoln, Neb, on "Progress in Tuberculosis Eradication in Nebraska," was read by his assistant, Dr. F. R. Woodring. The paper is a tribute to the aggressive work of Dr. Spencer, his helpers and the practitioners of Nebraska. The work in tuberculosis eradication began in August, 1918, with two state and two federal veterinarians employed. At the present time 497 herds are under supervision, with 100 signed applications on file awaiting their turn. Twelve veterinarians are giving full time to the work and the state legislature is being asked for $300,000 to continue the work of cleaning up the herds of the state. A state law requires the annual testing of all cows from which milk and cream are to be sold to be consumed in the raw state. Public sentiment has been changed so that it now strongly favors tuberculosis eradication and the veterinary practitioners are giving hearty co-operation in the work, private testing being carried on to a much greater degree than ever before.

Mr. Wayne Dinsmore, secretary of the Horse Association of America, gave a very able address on "Economic Factors Favoring Horse and Mule Production and Use." Mr. Dinsmore's forceful style, faultless diction and sound logic made a very strong impression upon his auditors. He maintains that the horse has been largely supplanted in industries because of the faulty knowledge regarding operation costs, and that where comparative costs have been made, horses are still in use, or motors are being sold with the intention of restoring the horse to his rightful place. The farm tractor, according to his investigations, is rarely a satisfactory substitute for the horse and the man who has used a tractor for a few years is one of the horses' best friends. The organization which Mr. Dinsmore represents is enrolling many veterinarians and veterinary societies, and by contributing to its support and its work in disseminating facts regarding the horse, the veterinarians are not only benefiting themselves, but are preventing farmers, merchants and others from adopting costly motor machinery to replace their trustworthy horses and mules. Members of this organization receive voluminous literature containing the results of extensive statistical studies.

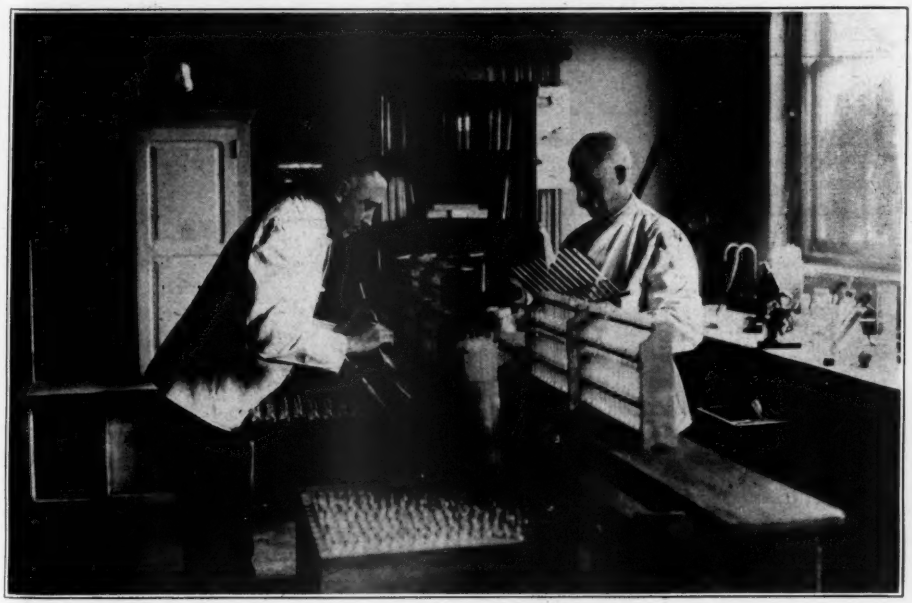
Mr. P. H. Ross, acting director of extension service, University of Missouri, discussed in an able manner the relation existing between extension workers and practicing veterinarians. Mr. Ross is fully conversant with the friction which has existed in some sections between county agents and veterinarians, which he attributes largely to a failure of many county agents to understand their proper duties and to a lack of get-together spirit on the part of both parties. These conditions he finds have largely disappeared and in many sections the county agents and veterinarians are working hand in hand to their mutual advantage. Speaking of his own state, he desires the co-operation of veterinarians in learning of unwarranted acts on the part of extension workers, particularly if they seem to be encroaching upon the duties properly belonging to the veterinarian. His address was heartily applauded and we believe greatly appreciated.

Dr. John R. Mohler, Washington, D. C., who was on the program for a paper entitled "The Veterinary Practitioner in Animal Disease Control," found it impossible to leave Washington because of duties in connection with agricultural legislative work.

Dr. L. U. Houck ably represented his chief, reading his paper and participating in a num-

ber of the discussions. Dr. Mohler's paper drew attention to the necessity for central direction in matters of disease control, particularly when dealing with the great animal scourges. Federal authorities have, however, too small a force to undertake such work single-handed and have limited authority when dealing with intrastate problems. It becomes necessary, therefore, that they should co-operate with state forces and so far as possible with private practitioners. In all great undertakings the federal government has met with considerable opposition, not only from the public but oftentimes from veterinary practitioners who feared that their own interests were being jeopardized. Experience has shown, however, that in all such undertakings the practitioner has been benefited rather than harmed by federal action.

Speaking more specifically of the accredited herd plan for tuberculosis eradication, Dr. Mohler drew attention to the criticism from some quarters because of the exclusion of practitioners from participation in this kind of work. The plan originated with the U. S. Live Stock Sanitary Association and representatives of pure-bred cattle breeders' associations and was submitted to the Bureau for its consideration. One of the provisions of the plan was that "Tests shall be made under the supervision of the Bureau of Animal Industry or a regularly employed veterinary inspector of the state in which co-operative eradication work is being conducted." Thus under this rule, only certain agents were recognized as legally qualified for the work. Instead of proving a detriment, however, private practitioners have found that their private testing has been greatly increased, also that more of the interstate testing has been allotted to them in order that federal agents might devote more time to the accredited herd work. Reports from various state associations indicate that private testing has increased 50 percent in Michigan, 55 percent in Minnesota and nearly 100 percent in Iowa. That there has been an increase in private testing since the accredited herd plan has been in operation is also indicated by an increase of over 300 percent in the production of tuberculin by private concerns. This too, in spite of the fact that a much larger number of animals than formerly are now tested by the intradermal method, with a much smaller dose than is used by the subcutaneous method. In other words,



SERUM DIAGNOSIS ON A LARGE SCALE.

Thousands of samples of blood serum from horses are tested annually in the laboratories of the Department of Agriculture, Washington, D. C., for signs of dourine, an infectious disease of horses, by means of a complement fixation test.

the accredited herd plan has stimulated such an active response on the part of the owners of good stock that more attention is being paid to their health and care. All such measures are sure to redound to the benefit of the veterinary practitioners in communities affected.

Dr. H. M. Graefe of Topeka, Kansas, read a comprehensive paper dealing with suggestions for the handling of recently vaccinated swine to eliminate ill results. The Doctor emphasized as essentials, potent serum and virulent virus, properly administered in proper dosage, following which there must be exercised the best of care for the swine in order that the immunity produced will be of sufficient intensity to overcome the virus introduced and provide later immunity as well. Conditions of housing, feeding and exposure which deplete and lower general resistance render it impossible for the animal to counteract the effects of virus and build up antibodies for later protection. He regards much of the trouble which has been variously summed up under mixed infection, swine plague, etc., as intimately connected with low grade cholera infection. He considers that the value of bacterins in offsetting such mixed infections has been over estimated. In so-called hog cholera breaks he advises revaccination with serum alone with good sanitation and after-care.

Interesting Operations at Clinic.

The work of the clinic was in charge of Dr. H. M. McConnell and his assistants. The first series of cases were those of diseases in chickens. Dr. R. C. Moore performed an interesting teat operation on a cow. Dr. W. L. Boyd of St. Paul, Minn., demonstrated his treatment for sterility in cows. His work is of a very high order and his advice was eagerly sought. Sterility in sows was discussed by Dr. J. L. Hearn of Texarkana, Ark., from the standpoint of the breeder of swine. Dr. J. W. Connaway of Columbia, Mo., is especially asking that information which might be of value in connection with the possible co-relationship of abortion disease in swine and cattle be reported to him for use in connection with work which he is undertaking.

Dr. S. W. Alford demonstrated the cutting of ties in the back of a Hereford heifer as a means of preparing the animal for exhibition. Following the clinic, the Kansas City Stockyards Co. entertained the entire body, including the visiting ladies, at a substantial dinner on the ninth floor of the Livestock Exchange Building. A vote of thanks was tendered the Stockyards Company for its courtesy in connection with the dinner and the facilities provided at the sales barns for conducting the clinical program.

The next meeting of the association will be held in Omaha, probably during the second week in July. R. F. BOURNE, *Secy.*

Fort Collins, Colo.

Kentucky Veterinary Medical Association Holds Meeting.

Various topics pertinent to the veterinary profession were considered at a meeting of the Kentucky Veterinary Medical Association, held Feb. 9 and 10, at Paducah.

The meeting was called to order by the President, Dr. D. E. Westmoreland, and Dr. Charles W. Fisher, Danville, Ky., responded to Mayor Katterjohn's address of welcome. Following the president's address, reports were made by the committee on legislation and necrology.

The papers and addresses included: "Disease of Sheep in Kentucky," by Dr. F. O. Schneider, Frankfort, Ky.; "Hog Cholera and Its Control," by Dr. Walter Lopp, East St. Louis, Ill.; "Epizoology for the Sanitarian," by Dr. Charles W. Fisher, Danville, Ky.; "Infection Following Castration of Swine," by Dr. W. M. Coffee, LaCenter, Ky.; "Foreign Bodies, One Thing and Another," by Dr. David Smith, Shepherdsville, Ky.; "Poultry Diseases," by Dr. J. A. Steiner, Ames, Iowa; "Important Diseases of Cattle in Kentucky," by Dr. W. W. Dimock, Lexington, Ky.; "Veterinary Extension Work in Kentucky," by Dr. T. P. Polk, Lexington, Ky.; "Co-operative Testing of Cattle for Tuberculosis," by Drs. W. H. Simmons, Lexington, Ky., and W. F. Biles, Frankfort, Ky.; "Combination Tuberculin Test," by Drs. F. G. Riedall, J. J. Gough, A. O. Longnecker and R. F. Fisher.

Clinics were held at the Dr. Robert F. Fisher Hospital, Drs. C. H. Richards, A. S. Barnes, Carl Beyer, W. M. Coffee, W. M. Purdy, E. Calldemeier, Charles W. Fisher, C. G. Warner, E. P. Farley, and R. F. Fisher participating.

Large Attendance at Iowa Veterinary Association Meeting.

The thirty-third annual meeting of the Iowa Veterinary Association was by special arrangement made a co-operative session with the sixth annual conference for veterinarians arranged by the veterinary division of Iowa State College. The two meetings were scheduled for Jan. 17, 18, 19 and 20, the program of the first two days being held at the college in Ames and the last two days at the Hotel Savery in Des Moines.

The interest of the Iowa veterinarians in the

VETS IN DRY KENTUCKY—As Seen by Their Official Cartoonist.

1—Drs. A. O. (Jiggs) Longnecker and Bill (Dinty) Kickman, detained, cuboid trouble. 2—Dr. Stemler. 3—Drs. Jacob Winkler and Moses Boller, singing "America" in Yiddish. 4—Eradicators: Dr. Overby, Sin, and Dr. Biles, T. B. 5—Dr. Schneider being "fat vamped." 6—Dr. Berger sights an intradermal reaction. 7—Dr. Farley bringing in a "What not." 8—Dr. J. E. Peterman. 9—Dr. Reidel, the C. Chaplin of the P. M. stage. 10—Dr. Andrew W. Miller, on "Chi-ro-practic versus aphrodisiacs." 11—Dr. Steiner, "Poultry Diseases." 12—Dr. Allan Barnes, recovering his health. 13—The Rotarians present a difficult case to Dr. Dimock. 14—Dr. Coffee, "Infectious Growths After Castration." 15—Dr. H. C. Winnes and his Jinx. 16—Dr. W. H. Simmons, State Veterinarian, urging the practitioners to "come to the front." 17—Dr. John K. Ditto, getting by on account of his size) with his tale of the alarm clock in the cow. 18—Dr. Westmoreland suffering from Amnesia. 19—Dr. M. A. Purdy, who condemned the first T. B. cow in Kentucky in 1896. 20—Dr. C. W. Fisher "spades" a bitch in oestrum—the bitch. 21—Dr. Allison. 22—Dr. C. A. Simpson. 23—Dr. Edwin Calldemeier and his "Spirituous Adviser." 24—Dr. T. P. Polk, giving thanks on his return to ole Kentucky. 25—Captain Sifler, Stanford, Ky., looking for a good location. 26—Dr. G. N. Wickwire, demonstrator de luxe. 27—Dr. Robert F. Fisher, president. 28—Dr. Ocie Carter. 29—Dr. Tyree. 30—Dr. J.A. Austin. 31—Dr. Hess of Ft. Dodge. 32—Dr. Warner. 33—Dr. Glacken. 34—The reporter of the Paducah Enterprise, who "covered" the meeting. 35—The Goat.

meeting may best be shown by the attendance, approximately 300 veterinarians being present. Marked interest was shown in all sessions of the program. At the close of the practictioners' conference at Ames a special interurban train was provided to carry the veterinarians to Des Moines, where a two-day session of the Iowa Veterinary Association opened on Wednesday morning.

Following the address of President S. K. Hazlet of Oelwein, Dr. H. W. Turner of the Pennsylvania State Bureau of Animal Industry gave a very interesting discussion on "Tuberculosis Control," using charts to illustrate various points. Dr. R. M. Morten's reports on "Gohn Sachs Bacillary Infection in Swine," which followed, brought forth considerable discussion relative to practical skin disinfection and also to the proper technic in the use of various kinds of biological products.

On Wednesday afternoon Dr. Robert Graham of the University of Illinois gave a very interesting discussion, illustrated by lantern slides, on the subject of "Botulism in Domestic Animals." Dr. Graham's talk was much appreciated and brought out very interesting discussion. A series of most interesting papers on surgical topics was presented by the various members of the committee on surgery. Dr. W. F. Guard of Ames, chairman of the committee, presented an interesting paper on "Umbilical Hernias in Swine," presenting his technique and data compiled from reports received from a hundred or more veterinarians as to the most successful methods of operating in this condition. Dr. N. A. Kippen of Independence discussed "Surgical Treatment of Traumatic Pericarditis," which was followed by a paper on "Dystokia in Sows," by Dr. C. F. John of Osage, in which methods of delivery other than the Cesarean operation were emphasized. Dr. John Patterson of Hedrick presented an excellent paper on "Treatment of Extensive Burns and the Regenerating of Skin Over Granulating Wounds." A paper entitled "Fractures" was presented by Dr. M. E. Dicken of Washington.

Drs. J. H. Lynch of Fonda and K. W. Stouder of Ames, representing the committee on sanitation, discussed problems relative to that subject, Dr. Lynch emphasizing the matter of proper disinfection of farm buildings and Dr. Stouder that of the value of proper ventilation as means of disease control.

Thursday forenoon was devoted almost entirely to a business session, including reports of the committee on legislation by Dr. Peter Malcolm, state veterinarian, and the committee on veterinary fees by Dr. H. B. Treman of Rockwell City. Following the report of the executive committee, 60 new applications for membership were favorably acted upon, which gives the Iowa Association a total active membership of 512. The secretary-treasurer's report showed the association to be in excellent financial condition. The following officers were elected for the new year: President, A. Kaderabek, Fort Dodge; first vice-president, E. A. Buxton, Vinton; second vice-president, C. W. Anderson, Jewell; secretary-treasurer, H. D. Bergman, Ames (re-elected), and member of executive board, A. L. Wood, Hampton.

Following the business session the day was devoted to papers and discussions as follows: "Strongyloidosis in Horses" was discussed by Dr. C. H. Covault of Ames, who emphasized the fact that this condition is quite prevalent in Iowa and discussed the lines of treatment which have seemed most successful. Dr. H. E. Pinkerton of Fort Dodge discussed "Observations on Diseases of Swine."

The committee on therapeutics presented the following interesting papers: "The Physiological Action of Pharmaceutical Agents as Determined by Experimental Study," by E. R. Steel of Grundy Center; Therapeutics of the Diseases of Suckling Pigs," by H. A. McIntire of Maquoketa; "Treatment of the Common Stomach and Bowel Diseases of Cattle," by O. N. Schultz of Latimer, and "Therapeutics of the Digestive Tract of the Horse," by A. J. Treman of Lake City.

The subject of "Azoturia" was handled in an interesting way by Dr. N. R. Allen of Perry. He emphasized certain points relative to the proper nursing and symptomatic treatment of this disease. Dr. A. I. Kulp of Adel discussed "Hemorrhagic Septicemia" from the standpoint of the practitioner in the field, calling particular attention to some of the difficulties encountered by the practitioner in attempting to diagnose and recommend satisfactory means of coping with the disease. Dr. A. Eichhorn of New York City discussed this disease from the laboratory standpoint, including a brief discussion of the various biological products which have been recommended in its control. The evenings were devoted to class and group reunions, committee meetings, and recreation in general.

Ames, Iowa. H. D. BERGMAN, Secretary.

The Haver-Glover Page

PUBLISHED EVERY NOW AND THEN IN THE INTERESTS OF THE GRADUATE VETERINARIANS.

Our Catalog

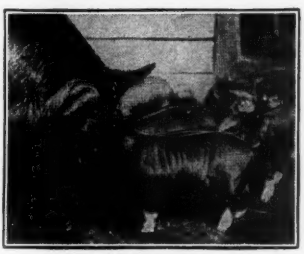
We expect shortly to be in a position to supply the many requests for HAVER-GLOVER Catalogs. By constant effort during the past few months, we now have all copy in the hands of the printer and a promise of delivery of catalogs the first of April.

It is our belief that each individual who receives a catalog will feel rewarded for waiting so patiently for these complete reference books, and in this connection we do not hesitate to state that it is the finest and most comprehensive catalog ever published.

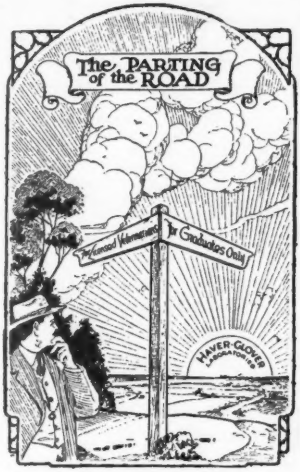
See that you are listed so that you will receive one of the first copies available.

Little Pig Troubles

Reports from many sections of the country are proof that the Spring pig crop is being damaged by infections peculiar to infant swine during the early days of their lives. Laboratory and field examinations during the last few weeks have shown the same array of infections as have taken a toll from the pig crop year after year. Many localities have learned to prevent these troubles through the activities of the practicing veterinarian, while in others, doubting Thomases still exist. Such diseased conditions as pneumonia, ne-



crotic stomatitis, and septicemic infections can be prevented. Sanitation must not be disregarded, but this alone will not prevent or cure these conditions. There is a reliable way to insure the pig crop, and we know what it is.



Those Who Buy Must Decide
—By what guide posts they will be directed.

What Is a Veterinarian?

In this column we are going to present a little comment as to the qualifications of a Veterinarian; who is really eligible to use the term and why. Expressions from our friends are solicited.

H-G Sales to Graduates Only

"Am very much pleased to learn that a real, honest-to-goodness company is going to do business that every licensed quack in the country cannot do business with. As you know, "Selling to Veterinarians Only" does not mean much, if all the licensed non-graduates can get it."—Dr. C. C. Hastings, Williamsville, Ill.

"I know when E. K. says "FOR GRADUATES ONLY," there is only one thing meant, and when you talk to Vets in the Middle States who know E. K. they never say, as I have often heard, "Give them a big enough order and they will break over." Such service means one thing only, and that is, the goods must be good for they are going only to him who knows what *good* means."—Dr. W. L. Hollister, Avon, Ill.

Mixed Infection Vaccines

It has been said that a Mixed Bacterial product is like that horrible thing, a shot gun prescription. Some claim it is unscientific and wrong.

Unfortunately for science and scientific ratiocination, Nature is by no means scientific in that sense, for Nature does not hesitate to infect human and animal bodies with multiple or mixed micro-organisms. Naturally the clinical symptoms and tissue changes are in relation to the harmful action caused by the combined activities of the various bacterial invaders.

In practice it is impossible to determine a specificity in infection. Even in the laboratory findings of a given case of infection it is often quite impossible to determine the principle causative factor of the diseased condition. It is much more reasonable to suppose that the whole conglomeration of bacteria present are contributing to the cause of the pathologic conditions existing. Therefore, it is only reasonable to suppose that mixed bacterial products should be used in preference to so-called "Specific products," if such biological therapy is at all permissible. From the standpoint of practical results in the prevention and treatment of bacterial infections in man and beast, this logic is sound.

"When we come to the gate at the end of things,
And have ended the race we've begun,
We hope that we're scored, not for the dust we have raised,
But the kind of a race we've run."

Farmer: "I doctor my stock by the aid of doctor books."
Veterinarian: "Yes, and some day they will die of misprint."

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Water will not immunize hogs

Alabama Veterinary Medical Association Holds Polymathic Meeting.

The fourteenth annual meeting of the Alabama Veterinary Medical Association was held at the College of Veterinary Medicine, Auburn, Ala., Feb. 23-26.

A paper on "Septicemia in Chickens" was read by E. Everitt, followed by one on "Roup, Diphtheria and Sore Head in Chickens," by F. D. Patterson. "The Common Diseases of the Cat" was next considered by N. B. Tyler, and A. L. Holloway presented a paper on "Diseases of Rabbits." These four papers drew forth many questions and suggestions from practitioners. They were eagerly followed by the attending veterinarians, because the average practitioner is now catering to all branches of practice.

The time-worn subject, "Distemper in Dogs," was next given consideration by G. S. Phelps. It called forth a variety of opinions, methods and theories. It seems that there is still much to learn regarding the long-known, uncontrollable and untreatable canine distemper.

J. S. Andrade read a paper on "Mastitis in Cows." He stated that most cases of chronic parenchymatous and catarrhal forms were incurable. Acute and sub-acute cases can sometimes be treated successfully. Warm-water fomentations, applications of antiphlogistine, injections of boric acid solutions and the administration of one quart of coffee with one dram of formalin three times a day for three to five days in acute cases of mastitis were advised by him.

The subject of traumatic pericarditis was taken up as a general discussion. How to make a positive diagnosis of an acute case at an early stage when it might be possible to remove the penetrating foreign body by performing rumenotomy and thus save the life of the animal was the predominating feature of the discussion.

The men in practice desire a means of making a definite, early diagnosis. After all, it seems the only way is by an exploratory and remedial rumenotomy. In the chronic case it was agreed that the most constant or most nearly accurate diagnostic symptoms was the edema of the brisket and substernal regions. From the literature it appears that there is no accurate means of making a clinical diagnosis of traumatic pericarditis one hundred percent correct.

Diseases of the digestive tract of mules and horses by M. F. Jackson brought out a most animated discussion and many and varied opin-

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ions were expressed. Dr. Jackson treats the mine mules for one of the large steel companies in the Birmingham district, and prevents digestive diseases by careful feeding and handling.

H. C. Wilson read a short B. A. I. bulletin on "Necrobacillosis in Swine."

A new treatment for stomach and intestinal worms in cattle and sheep was next explained. This treatment has been succeessfully used by the McNiel Experiment Station of Mississippi.

Copper sulphate (powdered)..	8 ounces
Snuff	8 ounces
Water	5 gallons

Soak the snuff over night in 1 gallon of water. Dissolve the copper sulphate in 2 gallons of water. Mix and strain; add water to make 5 gallons. Doses, the same as the 1 percent copper sulphate solution for stomach worms. Repeat the treatment in seven days.

D. J. Meador read a paper on "Osteomalacia," a disease found in the coastal plains or wire-grass region of the south. It is apparently due to lack of proper vitamines, a deficiency disease affecting not only the bones but the muscles.

Numerous reports of cases of various kinds were brought before the members for diagnosis, treatment and general discussion.

N. G. Covington held a complete autopsy (a la Crocker) on the cadaver of a heifer. Emaciation, anemia and parasites in the stomach and intestines were found.

Tuberculosis and tuberculin testing was next on the program. R. S. Sugg led off with a discussion on "Tuberculin Testing of Hogs." He advises the intradermal test applied to the ear. In his experience every reactor gave positive lesions on postmortem. It can be applied in combination with the ophthalmic test. Elmer Lash of the B. A. I. read a paper on the combination tests. He advocated the combination only of (1) intradermal and ophthalmic, (2) subcutaneous and ophthalmic.

C. J. Becker then read and explained the B. A. I. regulations covering tuberculin tests for accredited herds and for interstate shipment.

These papers led to numerous discussions and questions, because many of the veterinarians anticipated taking the examination required by the state and A. A. I. for the testing of accredited herds.

About 12 cows and calves and 10 hogs were tuberculin tested by the combination methods. Only one cow reacted. The reactor gave positive intradermic and ophthalmic reactions. She

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was slaughtered and lesions were found in the mesenteric, mediastinal and bronchial lymph glands, and in the apical lobe of the lungs.

One evening and one afternoon was taken up by the veterinarians present reviewing the pathology and lesions of tuberculosis in cattle and hogs; also the different tuberculin test and the state and federal regulations, all of which was found to be good preparations for the examination.

Thursday night the college veterinary medical association gave a banquet at the Varsity Cafe. Nearly 150 attended and the toasts were timely, fresh and digestible, as well as laugh-getters.

On Friday a polyclinic was held. Three cases of fistulous withers were exhibited, on all of which a radical operation had been previously performed and all diseased tissues (muscle, fascia, ligaments and bone) had been removed. Each one was making a good recovery. One ventral hernia operation in pig was performed and a tumor was removed from a mule. A mule was exhibited that had been operated on by the French method for cartilaginous quittor and the cicatrix still caused some pain; then metacarpal neurectomy was performed on that side, removing the pain and lameness. Another case, a mule had enlarged and contracted flexor pedis tendons. The high and the low tenotomy operations had been performed, but the mule remained very lame. Then median neurectomy was performed, the mule remaining still somewhat lame. A litter of six setter pups eight weeks old, each one having a well marked case of rachitis, was exhibited for diagnosis and treatment.

On Saturday morning thirty veterinarians took the federal and state examination from 9 a. m. until 12 noon, which if creditably passed gives them the right to test accredited herds. It appears that some veterinarians look upon tuberculin testing as easy work But the profession must know that it is difficult and that the science of applying and interpreting the reactions requires study, skill and close and careful scrutiny. Make it accurate and then it will mean something and be accredited in fact.

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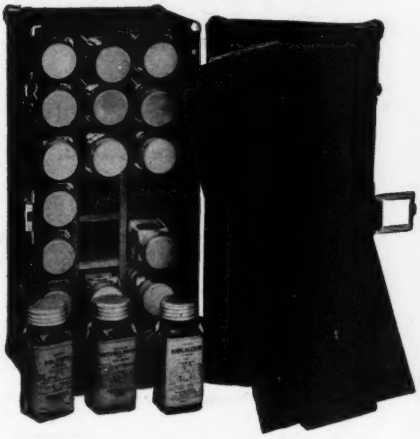

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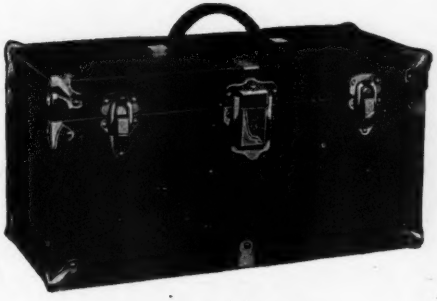

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Ontario Veterinary Association Holds Live Meeting.

At the meeting of the Ontario Veterinary Association, held at the Ontario Veterinary College, Toronto, Feb. 16 and 17, 1921, all parts of Ontario were well represented, and the holding of semi-annual instead of yearly meetings was justified.

An address of welcome was given by the Hon. Manning W. Doherty, Minister of Agriculture, followed by Dr. J. G. Rutherford of the Board of Railway Commissioners. Both gentlemen emphasized the great responsibility resting upon the veterinarian in furthering the development of the live stock industry.

The afternoon session commenced at 2 p. m., with a discussion on the Veterinary Practice Act. Dr. McGilvray was the first speaker and fully explained all that had been done in connection with the registration of non-graduates. He pointed out that the members of the Veterinary Practice Board had thoroughly investigated every application and no certificate had been granted until they had satisfied themselves that the man was entitled to it according to the provisions of the act. Others taking part in the discussion were Dr. Fowler of Toronto, Dr. Hutton of Welland, Dr. Caley of Bracebridge, Dr. Kelly of Orillia, Dr. Watson of the Biological Laboratory, Ottawa, and Dr. Rutherford.

A discussion was held regarding the advancement and support of the Canadian Veterinary Record. This journal is now edited by Col. T. C. Evans, who explained the necessity for an increased subscription list. It is the intention to publish the magazine quarterly instead of semi-annually.

Before proceeding with the symposium on Contagious Abortion and Sterility, Dr. W. H. Moffatt of the V. V. M. Laboratories was invited to address the meeting and explain the nature of his preparation which he is distributing as a preventive and cure of contagious abortion. Dr. Moffatt stated that he was not there to discuss V. V. M. as regards its composition, but merely to tell the effect of its administration in herds where contagious abortion had occurred, and that he did not want judgment passed at this meeting regarding the efficacy of the product. There was considerable discussion after Dr. Moffatt had presented his paper, in which Drs. Batt, Gwatkin, Law, Watson, McGilvray, Rutherford, and Col. Mundhenk took part. The general impression created by the

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paper was that "V. V. M." had not been proven a cure or preventive of contagious abortion.

Dr. R. I. McIntosh then addressed the meeting on "Sterility." His address, dealing principally with the physiological features of the disease, was greatly appreciated.

Dr. Batt briefly outlined the physiology of the corpus luteum.

At 7:30 p. m. a banquet was held at the Walker House Hotel, at which about forty-six were present. Dr. Rutherford's address was witty and interesting, dealing principally with his experience when he first graduated and practiced in Indiana, New York, Mexico, and western Canada.

The next speaker was Dr. J. A. Amyot, Deputy Minister of Health, Ottawa, who is an honorary member of the association. Dr. Amyot pointed out to the veterinarians the importance of their work in caring for the live stock of the country. His advice was that the veterinarian should educate the farmers to an appreciation that they were now trying to make two-minute trotters out of hack horses; in other words, the average farmer is content with scrub stock when it costs no more either in time or money or labor to take care of the genuine article. Dr. Amyot also spoke on food values, dealing principally with milk.

Dr. Barnes, chief inspector, Meat and Canned Foods Act, gave an interesting address, referring to the inspection of meat and canned foods during the war.

The next speaker, Dr. C. D. McGilvray, principal of the Ontario Veterinary College, gave an outline of the course now being given at the college.

Col. R. L. Mundhenk of the Abbott Laboratories spoke of his pleasant memories of associations with wearers of the Maple Leaf in France during the late war.

The morning session on Thursday commenced with a demonstration in the casting and restraint of horses, by Dr. D. R. Caley.

Dr. W. J. R. Fowler performed the radical operation for poll-evil, and Dr. J. Porter performed a cryptorchidectomy. Both operators thoroughly explained their technic to the interested audience, and were assisted in their operations by Drs. McIntosh and Collett.

The meeting then adjourned to the lecture room, and Dr. J. B. Hollingsworth, chief food

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inspector of Ottawa presented a very interesting paper on "Better Dairy Cows."

The next paper was on "Sterility in Cows," by Dr. J. N. Pringle of Toronto. Mr. I. S. Stinnel of the Mulford Company read a paper entitled "The H. K. Mulford Company in the Veterinary Field," and Col. R. L. Mundhenk of the Abbott Laboratories also presented an interesting paper dealing with the idea of a tendency growing within us to make things in general more difficult and complex than they actually are. He referred principally to practice, pathology, and veterinary education. A hearty vote of thanks was extended to both these gentlemen for their excellent papers.

Representatives of the Parke, Davis & Co. and the Lederle Laboratories also addressed the meeting, after which an illustrated lecture, "Standardization of Drugs," was given by Dr. A. R. Fader, M. B., of the Parke, Davis Co.

Dr. A. Savage of Macdonald College, Quebec, an honorary member of the association, read an interesting and instructive paper on "Anesthesia in General Practice." Considerable discussion followed, dealing principally with the intravenous injection of chloral hydrate for narcosis, in which Dr. Savage has had great experience.

The last paper was read by Col. J. H. Wilson of London. His subject was "Veterinary Ethics." Although short, the paper was excellent and full of good points.

The meeting was brought to close by the sale of a number of the late Dr. R. A. Milne's books and instruments. Dr. Savage acted as auctioneer, and the sum of $101.35 was realized.

The next meeting will be held on the second Wednesday and Thursday in August.

Toronto, Ont. J. S. GLOVER, *Secy.*

Dr. George T. Bushong, a gradute of the University of Pennsylvania, died Feb. 26, aged 38 years, of cancer of the liver, following an illness of seven months' duration. Dr. Bushong was a member of the American Veterinary Medical Association, and from October, 1914, to June, 1920, was a member of the Pennsylvania State Live Stock Sanitary Board. He was well known and highly respected by the profession and live stock owners, and it is with regret that we announce his passing. He leaves a wife and three sons.

Dr. John Cevaal of Oostburg, Wis., was on March 3 made a happy benedict when he was united in marriage to Miss Marie van der Puy of Sheboygan, Wis. VETERINARY MEDICINE wishes Doctor and Mrs. Cevaal a long, happy and prosperous married life.

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Sangamon County Veterinary Association Holds Successful Meeting.

On January 19 the Sangamon County Veterinary Association, augmented by veterinarians from surrounding counties, met at Dr. A. S. Dickerson's hospital, Springfield, Ill., for a clinic, 50 veterinarians being in attendance at the meeting.

The first operation by Dr. Dickerson for paraphimosis was very interesting. This operation was made as described on page 57 of the January number of VETERINARY MEDICINE. The other very interesting operation was trephining for the removal of the fourth lower left molar, by Dr. H. N. Holmes. In this case the lower maxillary bone was very much enlarged with a fistulous opening below. Dr. Holmes with some assistance performed a practicable and very satisfactory operation.

At 6 p. m. dinner was served at the Nicholas Hotel, after which several interesting addresses were given.

The first speaker was Hon. W. W. Wright, head of the State Department of Animal Industry, and a breeder of Shorthorn cattle. He is always the enthusiastic friend of the veterinarian, and he stated that he would not know how to get along in the live stock business if he were deprived of the services of his veterinarian, upon whom he believed his success depended to a very large extent.

Dr. Robert Rives, president of the Corn Belt Serum Co., East St. Louis, Ill., spoke concerning the production of serum. He made it very clear that it was necessary for the producers to receive more money for their products if they were to remain in business, stating frankly that serum had been marketed during the past few years at a loss.

Chief Veterinarian A. T. Peters gave a very interesting and much appreciated talk on the welfare of the profession.

Dr. J. I. Gibson, field secretary of the Illinois State Veterinary Medical Association. also addressed the meeting, urging the veterinarians to support their county organization loyally and to become affiliated with the state association and the A. V. M. A. It is needless to state that Dr. Gibson is a favorite with the veterinarians throughout the state, although very modest. The doctor gave a very practical address.

Dr. Gibson spoke at the evening meeting urging organization by counties, with a plea that all become members of the state association. He also urged upon the veterinarians the necessity of

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closer co-operation, more cordial relations, more boosting and no knocking.

A question box was opened containing several interesting questions which were discussed at length. After the business session Dr. C. C. Hastings of Williamsville, president, gave a very earnest and interesting talk on the subject of co-operation and organization.

All present pronounced it a very pleasant and profitable meeting.

Much of the success of the meeting was due to the untiring efforts of Dr. W. B. Holmes, dean of all things pertaining to the veterinary profession in and around Springfield, and secretary of the Sangamon County Association.

Michigan State Veterinary Medical Association Holds Most Successful Meeting.

The thirty-ninth annual meeting of the Michigan State Veterinary Medical Association, held in the Surgery and Clinic Building of the Michigan Agricultural College February 8, 9 and 10, was one of the most successful meetings ever held by this association. The attendance was about 180, including about thirty ladies.

Dr. R. H. Wilson of Rochester, Michigan, presided and most of the first day's session was given over to the transaction of business. A question box was opened and conducted by Dr. H. Preston Hoskins of Detroit.

A dinner dance at the East Lansing Masonic Temple on the evening of the eighth was the social feature of the meeting.

Dr. David S. White of the Ohio State University presented a paper dealing with the history, duties and outlook of the veterinary profession. Dr. T. H. Ferguson of Lake Geneva, Wis., spoke on "Abortion and Sterility from the Practitioners' Standpoint," and later in the day, with Dr. C. B. Conyer of Richland, discussed teat surgery.

The following officers were elected: President, B. A. Perry, Hastings; first vice-president, A. Z. Nichols, Pittsford; second vice-president, B. J. Killham, Adrian; third vice-president, H. Preston Hoskins, Detroit; secretary and treasurer, R. A. Runnells, East Lansing.

At the clinic, held on the forenoon of the 10th, Drs. C. A. McKillop, J. P. Hutton and E. K. Sales performed two radical operations for fistulous withers and amputation of the tail of a horse affected with sarcoma.

A tuberculosis conference was held in conjunction with the meeting. The state and federal authorities and the college staff co-operated in making the conference a success. A herd of fifteen head of cattle was tested by the subcutaneous and ophthalmic methods and the intradermic and ophthalmic tests were demonstrated on six reactors from another herd. At the conclusion of the tests the animals were destroyed and the lesions demonstrated. The object of the conference was to help prepare veterinarians

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for the examination to be given by the Bureau of Animal Industry for the selection of practitioners to take over the accredited herds.

The ladies report having had a very pleasant time during the sessions. A theater party, the dinner dance, a tour of the college campus and a farewell get-together completely occupied their time. R. A. RUNNELLS, *Secy.*

East Lansing, Mich.

Illmo Veterinarians Hold Meeting at National Stock Yards.

Interesting papers and demonstrations were on the program of the Illmo Veterinary Medical Association at its sixteenth semi-annual meeting, held March 17-18 in the Exchange Building at National Stock Yards, Illinois.

Following the address of welcome by William Moody and response by Dr. L. R. McKinley, president of the association, the following papers were presented: "Transportation of Live Stock," by Dr. W. J. Embree, Chicago; "Diseases of Suckling Pigs," by Dr. A. T. Kinsley, Kansas City; "Abortion Disease and Sterility of Cattle," by Dr. G. H. Jungerman, Kansas City; "Handling of Vaccinated Swine to Eliminate Bad Results," by Dr. M. J. Huggins, National Stock Yards, and "Commercialism in the Profession," by I. C. Brenner, Chicago.

A banquet was held the evening of March 17, and Drs. D. F. Luckey, J. I. Gibson and C. D. Folse were among the speakers.

The second day's program included a demonstration of intradermal reactors, and a demonstration of vaccinating hogs by the intraperitoneal method by Dr. M. J. Huggins. A collection of pathological specimens found on autopsy was exhibited by Dr. J. S. Jenison. A paper on "Botulism Intoxication in Animals," illustrated with lantern slides was presented by Dr. R. Graham, Urbana, Ill., and one on "Infantile Paralysis" was presented by Dr. E. W. Saunders.

Massachusetts Veterinarians Consider Bills Before Legislature.

The regular meeting of the Massachusetts Veterinary Association was held at the New American House, Boston, Feb. 23, there being thirty-five members present.

John B. Lentz, V. M. D., of Amherst and Lawrence H. Batchelder of Millbury, Mass., were admitted to membership.

A discussion of the different bills before the Massachusetts legislature was held. The asso-

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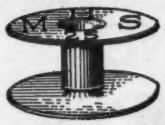

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ciation voted to appear in favor of senate bill No. 69, relative to payment for cattle reacting to tests made under the jurisdiction of the U. S. Bureau of Animal Industry and Massachusetts Division of Animal Industry. The association voted not to appear in favor of house bill No. 536, allowing veterinarians not connected with the Division of Animal Industry to use anti-hog cholera serum and virus.

It was also voted to arrange to hold a meeting of all New England veterinarians some time during the month of June, such meeting to be held in conjunction with the U. S. Bureau of Animal Industry. A committee of five was appointed to arrange for the date and place of meeting, and to make a preliminary report at the March meeting. HARRIE W. PEIRCE,

West Medford, Mass. *Secretary.*

Purity Biological Laboratories Reorganize.

Complete reorganization of the Purity Biological Laboratories of Sioux City, Iowa, was announced recently. This concern, for years regarded as one of the largest and strongest in the serum industry, in a statement issued by the new directorate, will cater to the veterinary profession exclusively.

Dr. D. W. McAhren is president and manager under the new organization, and Dr. I. B. Paxton will act in the capacity of secretary and sales manager. Both Drs. McAhren and Paxton have had wide experience in the serum business and are well qualified to fill the positions they will hold with the Purity company. They have a host of friends in the profession who wish them well in their new undertaking.

Prize Offered for Non-Slipping Horseshoe.

A prize of $1,000 has been offered for the most satisfactory horseshoe or device which will prevent horses from slipping on roadways or wherever in service. The prize is offered through the American Humane Association, 287 State Street, Albany, N. Y.

Veterinary College Proposed at University of Minnesota.

A bill has been introduced in the Minnesota legislature to create a veterinary college at the University farm, University of Minnesota. It has the unanimous support of the Minnesota Veterinary Medical Association.

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FOR SALE—Copies of American Journal of Veterinary Medicine from 1910 to 1920, inclusive. Also American Veterinary Review, 1912 to 1920. Nearly all in binders. Write Dr. J. A. Jessen, Shelby, Iowa.

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POSITION WANTED—By graduate veterinarian, age 29, married; preferably with commercial house or serum company. Five years' experience manufacturing serum, three years practice. Anything considered. Address No. 595, VETERINARY MEDICINE, Chicago.

WANTED—Opening as assistant by graduate veterinarian (Ohio State Veterinary College) in some good stock-raising community, preferably Ohio. Age 30. Experience in sterility and general practice. Address 596, care VETERINARY MEDICINE.

WANTED—Position as assistant to graduate veterinarian by 1921 graduate of Ontario Veterinary College. References supplied as to reliability. Address 599, VETERINARY MEDICINE, Chicago.

POSITION WANTED—By graduate Chicago Veterinary College, class 1917, age 25, assistant state veterinarian, Illinois. Experienced in serum production. Had commission in army. Have equipment. Three years general practice. Address 600, VETERINARY MEDICINE, Chicago.

WANTED—Veterinarian to work as assistant and take care of business while I am absent. Will employ good man for a year on very desirable terms. Value honesty more than experience. Have good mixed Illinois practice in fine locality. In first letter enclose photo, give experience, nationally, organizations, religion, associations, etc. Address No. 597, Care of Veterinary Medicine.

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A Tribute to Veterinarians.

In the program for the meeting of the Illmo Veterinary Medical Association, held March 17-18, the Moody Commission Co., National Stock Yards, Ill., printed a very fine appreciation, which we take pleasure in passing along. It was as follows:

"We doff our hats to the veterinarians! We enjoy the greatest satisfaction in your wonderful progress. Your achievements have challenged and demand the recognition of the world. You have successfully battled against prejudice, superstition and ignorance. The mossbacks who denied the existence of the foot-and-mouth disease, who ridiculed the idea that the tick transmitted Texas fever, are now occupying back seats along with those who insisted on making artificial cuds for the sick steer, boring the old, emaciated cow for hollow horn, and bleeding the horse for colic. You have literally made it possible to grow two steers, two hogs and two sheep where one formerly grew. Without your supervision, large live stock markets would be greatly handicapped, if not made impossible."

Dr. Robert Henry Gittins and Miss Edith Blaine, both of Mt. Sterling, Ohio, were united in marriage March 7. Dr. Gittins and his bride were graduated last year from Ohio State University. VETERINARY MEDICINE wishes them happiness and prosperity.

Dr. Charles F. Heininger, who practiced at Toluca, Ill., for a good many years, died recently at his home in Metamora, Ill., following a brief illness.

—o—

Live stock owners of Onondaga county, New York, decided to employ a county veterinarian at a meeting held several weeks ago.

—o—

Dr. T. F. Dunham of Stark, Kan., has joined in partnership in practice with Dr. P. B. Darlington at Chanute, Kan.

—o—

Dr C. F. Pauley has given up his practice at Findlay, Ill. He is now at his home in New York state, where he will remain until deciding on a new location.

—o—

Dr. O. A. Otteson is now engaged in practice in Rutland, Wis.

—o—

Dr. J. M. Atterberry recently established practice in Osceola, Iowa.

—o—

Dr. G. H. Dean, well known to many veterinarians who served in the army, will engage in

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practice in his home town, Arkansas, Kan. Dr. Dean was commissioned a major in the service.

—o—

Dr. Harvey Smith has moved from Winfield to Crown Point, Ind.

—o—

Dr. C. A. Turner, formerly of Galesburg, Ill., is now associated with Dr. W. W. Warnock at Aledo, Ill.

—o—

Dr. S. A. King, until recently with the bureau in Indianapolis, is now with the Meat Inspection Division, with headquarters at Phoenix, Ariz.

—o—

Dr. George A. Young of Syracuse, Neb., has been appointed a member of the state board, to suceed Dr. J. C. Bowman of Hebron.

—o—

The largest veterinary hospital in the United States and perhaps in the world will be established by the army department of the government at Ft. Reno, Okla. A 10,000-acre pasture will be maintained in connection with the hospital.

—o—

Dr. A. L. Stebbings has located in Park Ridge, Ill.

Dr. William G. Keehn has severed his connection with the Quality Laboratories of Kansas City to assume ownership of the Hygienic Laboratories of that city.

—o—

Dr. J. S. Koen, formerly with the Ft. Dodge Serum Company, will soon announce a new connection which will be of interest to veterinarians of the Middle West especially.

—o—

Dr. J. K. Hogan is now practicing at Corning, Iowa.

—o—

Dr. W. W. Parkinson died at his home in Mt. Carroll, Ill., early in March, following an attack of smallpox. Dr. Parkinson practiced in Mt. Carroll many years and was well and popularly known.

—o—

Dr. R. A. Moore of Mechanicsburg, Ind., has taken over the practice of Dr. R. N. Smith at Frankfort, Ind. Dr Smith is quitting practice because of poor health.

—o—

Dr. Rudolph Green of Pontiac, Ill., a 1920 graduate of the United States College of Veterinary Surgeons, Washington, D. C., is now lo-

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Big O Sales Co., Kansas City, Mo., 1614 W. 16th Street.
Southwestern Serum Co., Post Office Box 1512, Fort Worth, Texas.

cated in Salt Lake City, Utah, with the Bureau of Animal Industry.

—o—

Isaac Bechtel, who practiced veterinary medicine at Lansing, Iowa, for many years, died at his home there in February.

—o—

According to statistics recently compiled by Dr. C. P. Fitch of the University of Minnesota, disease has cost the live stock industry of the state nearly $8,000,000 annually for several years past.

—o—

The world's greatest live stock clinic is planned for the University of California, according to President David B. Barrows of the institution. The plans call for an expenditure of $750,000.

—o—

Dr. Harry Weeden is dead at his home in Coldwater, Mich, following an operation for appendicitis.

—o—

Dr. Benjamin F. Mill has opened one of the most attractive veterinary hospitals in the Middle West at Dennison, Iowa.

—o—

Members of many farm and live stock associations are urging the reappointment of Dr. M. Jacob to the office of state veterinarian of Tennessee.

—o—

Figures compiled recently record the loss of 125,000 head of hogs valued at $2,500,000 in the state of Ohio in 1919.

—o—

Idaho veterinarians held their annual convention at Boise on Jan. 25. The best meeting in the history of the association is reported.

—o—

Dr. N. W. Ackerman has taken over the practice in Little Rock, Ark., formerly owned by Dr. W. W. Bronson.

—o—

Harvey E. Newlin, William Hoffman and C. Williams, organizers and formerly large stockholders in the United Serum Company, disposed of their interests in the concern last week. No announcement of their future plans was obtainable. C. L. Charles, who with Mr. Newlin managed the affairs of the United Company, will remain in active charge of the house, with headquarters in Kansas City. Dr. Walter Lopp, who for several years was in charge of the company's Universal plant at East St. Louis, will, in the future, be stationed in Kansas City.